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SUPERIOR SAFETY PERFORMANCE: A REFLECTION OF AN ORGANIZATION'S CULTURE

INTRODUCTION

In previous editions of this book, this chapter was titled Successful Safety Management: A Reflection of an Organization's Culture. Note that in this edition *successful* has been replaced by *superior*. In discussions with some safety practitioners, I found that what they considered *successful* might really be only slightly better than average and not superior.

What is described here is a reflection of the safety initiatives in a few large, worldwide companies where the safety record truly is superior, meaning outstanding in relation to others in similar businesses. It's my view that if an entity wants to achieve superior safety results, compared to the best in the world, the concepts and procedures set forth here must be adopted. As the term safety is used in this chapter, it encompasses environmental affairs, occupational health and safety, and product safety.

In determining whether the safety results are superior, the incident experience and the costs, measured over a sufficiently long term, are the principle determinants. Subjective judgments won't qualify for this purpose. But, it is not suggested that achieving outstanding or excellent safety results is easy, whatever measures are applied.

I refer to an article titled Safety and Health Excellence Proves Elusive. It appeared in the July 2002 issue of *Occupational Hazards* (p. 28). Compilations are given of the reader responses to the *Occupational Hazards'*

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National Safety Survey. One of the questions asked was, How would you rate the safety and health program at your facility/organization? These are the composite responses:

Grade	Percent
Excellent	20.5
Good	51.8
Average	19.6
Fair	5.6
Poor	1.9
No answer	0.5

Giving generous credibility to the quality of the survey and to the subjective judgments that resulted in 20.5% of the responders rating their safety and health programs *Excellent*, it nevertheless occurred that 79.5% gave themselves a rating lower than *Excellent*. That is a realistic split. Being in the top 20% of safety performers, or better, is what this chapter is all about. As the term *superior* is used here, it means achieving incident experience and costs very much lower than the average for an industry or business.

I wrote in the second edition of this book that several transitions had taken place in the applied practice of safety since the first edition was published. To expand on what I had observed, I sought input on their current practices from safety professionals in five companies whose safety performance has been consistently outstanding within their business categories. They are very large conglomerates; a list of all their business categories would fill several pages.

Each company had been through at least one downsizing, and staffs were lean. Throughout their operations, more is expected of fewer people. Although their safety achievements were superior, in all five companies executive-led improvement activity was in progress. I discussed how, at that time, the model companies achieved outstanding safety performance, and I set forth the comments I would make to safety professionals on what is necessary with respect to specific elements of safety systems to achieve superior results.

Similar discussions took place in 2002 with safety professionals in four of the five companies with whom conversations had previously taken place: One of the companies disappeared in a merger. Another was added to replace it. What did they say? Strong pressure on the organization to produce financial results existed in 1996; it's stronger in 2002. Turmoil as to mergers and acquisitions, splitting of companies, and staffing levels is to be expected. Staffs are lean, and even more is expected of them.

My principal question was, What significant changes or additions have been made with regard to elements in your safety management systems? That produced a surprising response from all of them: none. They did say that emphasis on specific safety management elements varied from year to year. As one safety professional said:

> Not one new safety program element has been added in several years. We thought we were doing well, until a new member arrived on our board of directors who took the position that we could do better. Through his influence, a culture change has taken place that heavily influenced senior management and its accountability system. The same, good safety management systems we had in place are now more effective, and our results show it. Managers are held accountable in a way that was difficult for them to accept at first.
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> But, I need to say that emphasis on some of the safety system elements has varied over the past few years. For instance, we had a strong push for a while to overcome our ergonomics risks, and we've come a long way. Now, we're concentrating on what we know to be the improvement needed in our accident investigation process, and on our high-risk jobs.

In a company that has achieved a 90% reduction in incident experience and in costs over a period of 15 years, the safety professional with whom I spoke said:

> Our incident experience and our costs are so low that achieving a twenty percent reduction in costs would not result in a number large enough to influence senior management to undertake further expenditures principally to get costs down further. In relation to our industries, we think our incident rates and costs are less than one-sixth of the average. We are feeling the effects of world competition, as is every one else. Staffing is lean throughout our companies. But the CEO hasn't let up on his insistence that we keep the incident rates as low as they are. We're fortunate that he knows it will be very difficult to get them lower. He maintains his position as the leader for safety, health, and environmental affairs, and the managers know that they are being held accountable for results.
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> As to new safety system elements, we don't have any. But we do try different things. You know that we use a lot of chemicals and we are reexamining our permissible exposure levels because we are determined to do better than the world standards. You'll be interested in this one new approach we're taking — we are addressing the gap between theory and reality, trying to do a better job of incorporating elements in our environmental, health, and safety systems within the concept of operational excellence. [Editorial note: Wow!]

All of the safety professionals with whom I spoke were affected by the World Trade Center tragedy, but not as much as I expected. They are employed in large companies that have extensive security staffs, on whom the responsibility for additional security measures fell. There is an overlapping of responsibility with security personnel since an element in all of their safety management systems pertains to "Emergency and Disaster Planning," which will be addressed later.

All of these safety professionals are aware that the culture in their organizations demands superior safety results, and we will start our review of what it takes to be an outstanding safety performer with a discussion of culture. (While safety alone as a term may appear in this chapter, it is to encompass all of the aspects of environmental, health, and safety matters.)

CULTURE DEFINED AND ITS SIGNIFICANCE

In all of the model companies, safety is culture-driven. Senior management is personally and visibly involved and holds employees accountable for results. The senior executive staffs display by what they do that hazards management is a subject to be taken very seriously, a subject that is considered in performance measurement along with other organizational goals.

What is meant by "culture"? An organization's culture consists of its values, beliefs, legends, rituals, mission, goals, performance measures, and sense of responsibility to its employees, customers, and community, all of which are translated into a system of expected behavior.

An organization's culture determines the level of safety to be obtained. What the board of directors or senior management decides is acceptable for the prevention and control of hazards is a reflection of its culture. Management attains, as a derivation of its culture, the hazards-related incident experience it establishes as tolerable. For personnel in an organization, "tolerable" is their interpretation of what management does. This phrase is often heard: *You will achieve the level of safety that you demonstrate you want to achieve.*

Several companies produce annual environmental, health, and safety reports that demonstrate the place that safety has within their cultures. Some of those reports are on the Internet and downloadable.

Excerpts of five such reports are given here, reproduced with permission, from Bayer, Air Products and Chemicals, Intel, Johnson & Johnson, and DuPont. In those reports, a pattern is evident that represents the absolutes necessary to attain superior safety results:

- Safety considerations are incorporated within the company's culture, within its expressed vision, values, beliefs, core values, and system of expected behavior.
- The board of directors and senior management lead the safety initiative and make clear by what they do that safety is a fundamental within the organization's culture.
- There is a passion for and a sense of urgency for superior safety results.
- Safety considerations permeate all business decision-making, from the concept stage for the design and development of new products, processes, and procedures, through to the disposal of the products made and the facilities in which the products are made.
- An effective performance measurement system is in place.
- All levels of personnel are held accountable for results.

Whatever the size of an organization — 10 employees or 100,000 — the foregoing principles apply to achieve superior safety results. Safety is culture-driven, and the board of directors and senior management define the culture and the expected pattern of behavior.

Health, Environmental and Safety at Bayer: Changing the World with Great Care, 2001

At Bayer Corporation, we are strongly dedicated to protecting and improving health and the environment. Our commitment goes beyond our products — which range from aspirin and antibiotics to pigments and plastics — to include safeguarding the health of our employees, our customers and business partners, our community members and plant neighbors, and the environment in which we all live. We meet this goal through one of the industry's most successful safety programs, a comprehensive waste reduction initiative and a nationally recognized environmental stewardship program.

We consider it our responsibility to protect the environment and health and safety of our employees, customers, business partners and communities; to comply with all applicable laws and regulations; and to establish and implement responsible practices where laws and regulations do not exist. Only by upholding these responsibilities can we continue to change the world with great care.

Protecting the Environment

It is because of our desire to protect the world we will pass on to our children that we strive to maintain a balance between manufacturing products we depend on in our modern world and safeguarding our environment.

Through sustainable development, industry can continue to grow while also protecting the environment.

Staying Safe

For decades, Bayer's safety record has been one of continuous improvement. Rarely has a year gone by without seeing a reduction in the number and severity of on-the-job injuries. Today, our award-winning program is an outstanding success and a model for other companies.

During the 1990s, our safety program reduced injuries by two-thirds, saving more than 2,000 employees pain and suffering. It is not unusual for our plants to go millions of hours without a lost workday due to an on-the-job injury. At some locations, years pass without an employee being hurt on the job.

Process safety is a prerequisite to worker safety and begins when the plant or manufacturing line is on the drawing board. From comprehensive design and hazard analysis through preventive maintenance and employee training, we assure our operations not only meet the Occupational Safety & Health Administration's (OSHA) Process Safety Management standard, but also are intrinsically safe.

The most important safety benefit is the improvement in the day-to-day health and safety or our employees. We not only want our employees to return home safely to their families, we want them to remain safe when they are outside their work environments. Many of our safety lessons can be applied at home as well as in the work place.

Taking Responsibility

At Bayer, we believe our responsibility does not end when we place our materials on a truck, barge or train for transport to the customer. Even when the product is in the hands of the customer, it is part of our commitment to product stewardship and the Responsible Care® program to help ensure the product is used correctly. We provide a full complement of safety information and extensive training to our customers, whether they are manufacturing tires or administering a life-saving drug to a child.

The following excerpts are from the *Bayer Corporation, Annual Report 2001*. Its theme is "Bayer: Success Through Expertise with Responsibility."

Substantial Reduction in Emissions Since 1990

We are among the leaders in our industry with a nearly 50 percent reduction in greenhouse (Kyoto) gases since 1990. Special emphasis is placed on "in-process environmental protection," a progressive concept we have rigorously pursued since the early 1980s.

Record Safety Performance

Bayer also made further progress in the areas of process, plant and occupational safety. The number of industrial injuries resulting in absence from work has been halved since 1990 and the number of recordable environmentally relevant incidents at Bayer sites has fallen more than 70 percent over the same period, despite the application of much stricter reporting criteria since 1998. Bayer's U.S. operations have the lowest injury rate. There, the number of injuries per million hours worked is less than half the Group average — the result of a highly developed safety culture. For two straight years (1999 and 2000), Bayer Corporation was rated by the American Chemistry Council (ACC) as the second safest large chemical company in the United States. Our aim now is to again halve, by 2004, the Group's MAQ (Million Working Hour Quota) and the total number of workdays lost through accidents.

Air Products and Chemicals — Environmental, Health, and Safety Policy

We will be an industry leader in environmental, health, and safety performance and are committed to the following basic principles in managing our business worldwide:

- Compliance with all applicable environmental, health, and safety laws and regulations.
- Continual improvement in environmental, health, and safety performance with the ultimate goal of zero injuries and zero emissions of toxic and hazardous materials.
- Design and operation of our plants and facilities in a manner that protects the environment and the health and safety of our employees and the public.
- Development and production of products that can be manufactured, distributed, used and recycled or disposed of in a safe and environmentally sound manner.
- Open discussion of our environmental, health, and safety practices and performances.
- Active participation in Responsible Care and similar initiatives in the countries in which we operate.

Excerpts from the Report Titled Air Products and Chemicals Inc. — Where We Stand 2001

Safety Performance: Number One Again

We had an outstanding year in terms of the overall safety of our employees. For the second consecutive year, Air Products was named the safest large-scale chemical manufacturer in the U.S. according to the American Chemical Council.

In earning that designation, we achieved the industry's best record in key categories, including lost-time injuries and recordable accidents, the category cited most often when comparing safety records inside the chemical industry.

In 2000, our total recordable incidence rate of 1.02 per 200,000 employee hours worked bettered our 1999 rate and was well ahead of the industry average for large companies of 2.26 recordable injuries per 200,000 employee hours worked. For the 2001 fiscal year, results continued to improve, with recordable accidents dropping to a rate of 0.82 per 200,000 hours worked. Lost-time injuries, the most serious accident category, improved slightly to a rate of 0.18 per 200,000 hours worked compared with a rate of 0.19 in the 2000 fiscal year.

The superb results we recorded this year were marred by a few serious accidents. While these were isolated incidents in a company with more than 17,000 employees, they were stark reminders that safety needs to be in the forefront of our minds at all times. We must be — and we are — focused on safety and our ultimate goal of zero injuries.

Intel Corporation's Environmental, Health and Safety Report 2001. As this report indicates, Intel has achieved remarkable results in safety management.

At Intel, we pursue EHS performance the same way we pursue performance in the marketplace. We have worked to become global leaders in EHS. This commitment is integrated throughout the corporation, from our executives to every employee.

— Craig R. Barrett
Chief Executive Officer

Intel is setting the benchmark for world-class safety performance. We benchmark our performance across all industries as well as with leading semiconductor manufacturers.

Intel employees continue to improve on their world-class safety performance. OSHA recordable injuries have decreased an average of 30 percent each of the last five years.

Despite the lowest injury and illness rate in the semiconductor industry — and possibly the lowest rates in any industry — we continue to improve our illness and injury performance. In 2001, we reduced our already world-class OSHA recordable rate by an additional 33% to 0.19 injuries per 100 employees. Said another way, Intel's safety performance is about 4,500% better than that of the average U.S. manufacturing company. [Editorial note: Intel's Lost-Day case rate in 2001 was 0.04, which is truly superior.]

Intel's Environmental, Health, and Safety Policy follows. It appears in the 2001 report under the signature of the CEO. The combined environmental, health, and safety policy was prepared in 1991 and was last revised in March 1998. Individual environmental, safety, and health policies predate 1991. From their inception, application of the policy statements has significantly affected the culture at Intel.

Environmental, Health, and Safety Policy

> We are committed to conserving natural resources, reducing the environmental burden of waste generation and emissions to the air, water and land. Through continuous improvement methodologies, we will develop environmentally compatible products and processes. We will strive to be leaders in reducing, reusing and recycling, and will ensure that any wastes remaining are properly disposed of in a safe and environmentally sound manner.
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> We will be a responsible member of the communities in which we live and work. We will continue to expand our knowledge and understanding of the effect of our operations on safety, health and the environment. We are committed to continuous improvement in our operations and to sharing the knowledge we gain with our employees, customers, suppliers, the communities in which we live and work, the scientific community, government and industry.
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> We will establish and maintain appropriate controls including periodic review, to ensure that this policy is being followed.
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> — Craig R. Barrett
> Chief Executive Officer

As the report says, Intel is setting the benchmark for world-class safety performance. Its safety efforts are obviously driven by its culture, which is demonstrated by its board of directors and the senior executive staff.

Johnson & Johnson's Environmental, Health, and Safety 2001 Sustainability Report

> In this report, a letter signed by both the Chairman of the Board and Chief Executive Officer and the Senior Vice Chairman of the Board, who is the Chairman of the Worldwide Environmental Steering Committee, follows a lead-in titled — **Healthy people, healthy planet**. They mention living their Credo promise every day. They say that:
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> Our people have demonstrated an unwavering dedication to environmental protection, employee wellness, workplace safety and community outreach. Johnson & Johnson's commitment to leadership in environmental, health and safety performance will continue in the future. We encourage all employees to be involved and work together so Johnson & Johnson continues to be a good neighbor and an exemplary corporate citizen.

Johnson & Johnson operates as a global organization with a decentralized management philosophy. Throughout our extensive network of companies, however, certain fundamental principles guide our daily activities. By establishing management structures that drive environmental, health and safety performance, we seek to integrate respect for people and the planet into our business practices worldwide.

Policies and Organization

Johnson & Johnson's policies and practices originate with Our Credo, a statement of the Company's responsibilities to customers, employees, communities and shareholders. Our Credo expresses the company's commitment to product quality, employee health and well-being, environmental protection, social outreach and sustainable business practices.

Environmental Strategic Vision

We are committed to environmental leadership, instituting the highest environmental values in all employees, utilizing the best environmental practices in all we do and focusing on sustainable growth.

Health and Wellness Strategic Vision

We are committed to optimizing the health, well-being and productivity of Johnson & Johnson employees.

Safety and Industrial Hygiene Strategic Vision

We are committed to making Johnson & Johnson the world leader in health and safety by creating an injury-free workplace.

At Johnson & Johnson, our commitment to environmental, health and safety leadership begins at the highest levels of the corporation. The Public Policy Advisory Committee of the Board of Directors oversees the Company's policies, programs and practices on public health issues regarding the environment and employee safety. This committee includes three board members and our Vice President, Administration, and Executive Committee Member, Russell C. Deyo.

The Technical Resources Group and Worldwide Benefits & Health Resources provide leadership, governance and support to Johnson & Johnson operating companies around the globe. Environmental, Health & Wellness, and Safety Professionals worldwide work to implement our programs in the operating companies.

For emphasis, I repeat from the foregoing: "By establishing management structures that drive environmental, health and safety performance, we seek to integrate respect for people and the planet into our business practices worldwide."

DuPont's Sustainable Growth 2001 Progress Report—Safety, Health & Environmental Section. These are excerpts from a letter from the Chief Executive.

> As a company preparing to celebrate our 200th anniversary in 2002, we hold as fundamental a culture that values the safety and health of people.
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> Our safety and health performance remains significantly better than the industry average. As a company, we have historically had very strong policies and actions related to the safety and treatment of our employees and the ethical conduct of our business.

The signature on the letter is interesting and unique. It is as follows: Charles O. Holiday, Jr., Chairman and Chief Executive Officer and Chief Safety, Health and Environmental Officer. DuPont has made a point for years that its CEO is also the chief safety, health, and environmental officer, and that is known throughout the organization. DuPont employees profess that safety is a part of its heritage, that safety is good business, and that safety makes the company credible.

Additional excerpts from the DuPont report that are pertinent to this chapter follow.

The DuPont Commitment

> We affirm to all our stakeholders, including our employees, customers, shareholders, and the public, that we will conduct our business with respect and care for the environment. We will implement those strategies that build successful businesses and achieve the greatest benefit for all our stakeholders without compromising the ability of future generations to meet their needs. We will continuously improve our practices in light of advances in technology and new understandings in safety, health and environmental science. We will make consistent, measurable progress in implementing the Commitment throughout our worldwide operations.

Highest Standards of Performance, Business Excellence

> We will adhere to the highest standards for the safe operation of facilities and the protection of the environment, our employees, our customers and the people of the communities in which we do business.

Management and Employee Commitment, Accountability

> The Board of Directors, including the Chief Executive Officer, will be informed about pertinent safety, health and environmental issues and

> will ensure that policies are in place and actions taken to achieve this Commitment.
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> Compliance with this Commitment and applicable laws is the responsibility of every employee and contractor acting on our behalf and a condition of their employment or contract. Management in each business is responsible to educate, train and motivate employees to understand and comply with this Commitment and applicable laws.

DuPont's Commitment statement is believed by its employees to be sincerely presented, and it is applied by management as written. It establishes a proactive rather than a reactive posture and implies anticipatory hazard prevention and control and the allocation of the resources necessary for accomplishment.

DuPont's emphasis on off-the-job safety is an additional indication of its culture. Off-the-job safety is treated as importantly as on-the-job safety. It is recognized that the factors influencing behavior and beliefs are the same in both environments. Companies that stress off-the-job safety are the exceptions.

Chapters of books and articles have been written with titles such as "The Hazard Control Process," "Basic Safety Programming," "Managing Safety Performance," "Management of Loss Control," and "Safety Performance." But none of the authors considered the impact of an organization's culture on the safety performance attainable. To achieve superior safety results, the system of expected behavior deriving from the culture must demonstrate that such results are to be attained.

In the model companies, safety professionals are expected to perform so as to be perceived as a part of the management team and as assisting the decision-makers in fulfilling their expectations. If accomplishment is the safety professional's purpose, then an understanding must be attained of the priorities of managers at a given time (expansion, contraction, capital expenditure restrictions, staffing constraints) and of the organization's culture and how to work effectively within it.

A principal goal for safety professionals should be to influence the organization's culture as it pertains to safety decision-making. Understandably, this goal may not be reached easily. Effecting a culture change doesn't get done quickly (a supertanker can't make a sharp right turn). An organization will experience the impact of the culture in place for quite some time. Significant cultural improvement or deterioration occurs only in the long term.

Because of rising costs, public embarrassment, or a number of other factors, management may decide that dramatic improvements in safety

must be attained in a rather short time. A bit of skepticism is appropriate when that occurs.

MANAGEMENT COMMITMENT, DIRECTION, AND INVOLVEMENT

In the model companies, senior management assumes responsibility for safety and provides the leadership necessary to achieve the superior results expected. Management has ownership of safety as a part of operating responsibility. It's understood that management commitment, direction, and involvement are the sine qua non, the prime requirement for effectiveness in safety. If superior results are desired, there must be a long-term commitment to long-term goals. That's an absolute.

What management does, rather than what management says, defines the actuality of commitment or noncommitment to safety. What management does permeates the thousands of decisions made that create the work environment, set design specifications for facilities and equipment, establish fire protection standards, respond to environmental needs, and so on. What senior management does is interpreted by the organization as the role model to be followed. It's at the senior management level that measurable goals are established for performance expectations.

ESTABLISHING ACCOUNTABILITY

Accountability for safety performance in the superior performing companies is clearly established with line management at every level. Safety performance is one of the elements scored in the organization's overall performance measurement system. Favorable or unfavorable results influence salaries, bonuses, and promotion potential.

One of the principal indicators of management commitment to safety is the inclusion of safety performance in the performance review system. Management commitment to safety is questionable if the accountability system does not include safety performance measures that impact financially and on the promotion potential of those responsible for results.

Here are two real-life indicators of the impact on managers of accountability systems in practice.

1. A plant manager, speaking at a conference, said that the first items discussed in his annual performance review were his achievements in relation to previously established goals for employee injuries and illnesses, environmental occurrences, and fires. Meeting or not meeting those goals

had a bearing on his salary. He was very much informed about incidents that had occurred, and his involvement was readily apparent. He could quote fire losses per 100 dollars of plant value to the mil.

2. A company became displeased with its employee injury, motor vehicle, and product liability incident experience. Its senior executives arranged a visit to a facility of another organization, known to have a superior incident record. When discussions commenced, visitors were surprised that the meeting was run by the manager of the host location. It became obvious that the safety program was the manager's program and that he considered himself to be accountable for it. The facility manager spoke in depth of his personal involvement in capital expenditure considerations for hazards management, of his requirements for the safety and health professional staff, of the system in place through which he maintained accountability, and of his expectations of the staff immediately reporting to him. During the plant tour, which he led, he commented extensively on the specifics of hazard prevention and control measures in the facility, displaying his personal involvement.

SAFETY ORGANIZATION AND STAFF

Fewer safety professionals are employed now in most of the major companies with which I have had association in the past few years. Nevertheless, the superior performers still maintain a top-quality staff, which is a requisite for the accomplishment level defined by the culture. The safety staff is expected to earn recognition and respect and establish their capabilities, thereby being sought by decision makers for their views. They are a part of management and have ready access to senior executives.

An organization's personnel will "read" the import given to safety by management through its appraisals of the qualifications of the safety staff and their reporting place in the management structure. If the safety director's position is treated as insignificant, management instructs the organization that safety is insignificant. There is no one magic reporting structure for the safety function, except that the senior safety executive is not far from the top in companies where results are superior.

In one such organization, the vice president for safety, health, and the environment reports to the senior vice president for human resources and corporate plans who reports to the chief executive officer. In another company, the vice president for environmental affairs and safety reports to the executive vice president who reports to the chairman.

In both of these organizations, safety, health, and environmental affairs have been brought together under a single management. That is the

trend — largely influenced by economics and the recognition that the arrangement presents synergy opportunities. An awareness has developed that the basic sciences of safety, health, and the environment overlap considerably and that greater management effectiveness can be attained under a single direction.

Equally important is the need for effective communication among the professionals involved in each hazards-related function. A case can be made for a unified management that includes all hazards-related professionals.

Professional requirements for safety personnel with regard to education, experience, accomplishment, and executive ability in those organizations whose cultures require superior safety performance have been moved up a few notches in recent years. Model companies expect their safety personnel to maintain professional competency and provide opportunities to do so. Their safety professionals are expected to be active in safety committees of trade associations and in technical societies. Also, they are encouraged to (a) expand their horizons through additional education and (b) increase their knowledge of operations so as to better understand and relate to the organization.

TECHNICAL INFORMATION SYSTEMS

In all organizations where safety expectations are high, technical information systems exist to serve as resources on hazard prevention and control. Personnel at all levels come to rely on those resources.

The extent of use of the technical information system is a reflection of the effectiveness of the safety, health, and environmental affairs staff.

COMMUNICATION AND INFORMATION SYSTEMS

Communication on safety by all levels of employment is encouraged as a part of the organization's culture. Management promotes a continuing and open discussion of hazards, incidents, and concerns about risks. At all levels, personnel are informed of the hazards of operations and of what is expected concerning them. Progress relative to established goals is published, discussed, and routinely communicated to employees. Two-way open communications exist throughout the organization. Thus, the knowledge and experience of employees is brought to bear to improve safety.

DESIGN AND ENGINEERING

In the model companies, the first outward indications of their culture with respect to safety are demonstrated through the superiority of their design

processes and decisions affecting new and altered facilities, equipment, processes, and products. Their design and engineering specifications are established to go beyond legal requirements and are intended to avoid unacceptable risk.

Where hazards are given the required consideration in the design and engineering processes, a foundation is established that gives good probability to favorable hazards-related incident avoidance. Also, the potentially large expenses of retrofitting are thus avoided.

This subject, until recently, has not been given sufficient attention by safety professionals. Design and engineering practices do not typically appear in outlines of safety management systems. Nor would the subject ordinarily be included in safety audits. Yet design and engineering decisions are primary in determining the eventual risk level, and they are most often made without input from safety professionals. Thus, safety professionals are typically confronted with the workplace, equipment, and products as givens, with thousands of design and engineering decisions affecting safety having been made without their counsel.

As a better understanding has developed of the phenomena of hazards-related incident causation and as ergonomics has emerged to have greater importance, safety professionals are required to give greater attention to design decisions. It has been a rewarding experience when safety professionals have been sought for their counsel in concept and design decision-making. There is both need and opportunity here for advice-giving by safety professionals.

HAZARD ANALYSIS AND RISK ASSESSMENT

Including hazards analyses in design concept discussions, in design and engineering decisions, and in process reviews is more frequently the practice. There is opportunity here for safety professionals to be perceived as providing a consultancy that produces economic benefits, in addition to improving safety. Those benefits, in addition to reduced costs for injuries and illnesses, are measured by (a) the costs avoided by not having to retrofit to remove hazards brought into the workplace and (b) improved productivity and cost efficiency.

Hazards analyses may be completed through mechanisms as simple as check lists, something more detailed such as Job Hazard Analyses or Preliminary Hazard Analyses, or in complex cases, Failure Mode and Effect Analyses. Whatever the mechanism, the goals are that hazards are to be anticipated, identified, and evaluated, and the appropriate avoidance, elimination, or control measures are to be determined and taken so that the risks deriving from the hazards are at an acceptable level.

MANAGEMENT OF CHANGE

Although the title of OSHA's standard for *Process Safety Management of Highly Hazardous Chemicals* suggests a limited application, over 50,000 employment locations could be affected by it. At many of those locations, such as public utilities and paper manufacturers, the final products are not chemicals.

OSHA's standard requires that "The employer shall establish written procedures to manage changes. . . ." The principle involved here is important and is having its impact far beyond chemical companies. What is required is that hazards be identified and evaluated when changes are made in design criteria, operations, procedures, and facilities. That's a good thing to do, and I recommend a broad application of the principle. It is a concept that can be applied in all businesses and industries, as the top performers have learned.

Many companies have said to OSHA personnel that complying with the management of change requirement would take considerable time. In effect, they are saying that the requirement is contrary to the typical practice and that a culture change would have to be achieved to put the required procedures in place. Getting a management of change element adopted in any safety management system extends the knowledge of personnel about hazards and risks, actually reduces risk, and reinforces safety policy.

ERGONOMICS AND HUMAN FACTORS ENGINEERING

A conclusion drawn from a study made by a major workers compensation insurer was that about 50% of reported claims and about 60% of their attendant costs had ergonomics implications. Similar data have been frequently published. As this information developed, safety professionals were required to undertake serious introspection concerning the content of their practice and how they spent their time.

Ergonomics has emerged to become a major element in the practice of safety. That is obvious in the model companies. As its significance grew, ergonomics promoted a greater recognition of the impact of workplace design decisions on both risk reduction and productivity. And safety professionals who acquired the additional knowledge and skill required to be proficient in ergonomics found that decision makers had a greater interest in their work because of its productivity and cost limitation implications. Ergonomics and human factors engineering have become synonymous and interchangeable terms. One university gives courses in both ergonomics and human factors engineering. The difference is that ergonomics covers workplace design and human factors engineering extends the study to include product design.

PURCHASING STANDARDS

A few safety professionals are proud of the greater influence they have had in recent years on the purchasing standards that are in effect in their companies. Working with design and engineering personnel and with senior executives, they have achieved a culture change that results in fewer hazards being brought into their operations when equipment and materials are purchased.

Including safety-related specifications in purchasing standards assists in attaining corporate goals for superior performance. There is great opportunity here for recognition and accomplishment by safety professionals. In a few companies, suppliers of equipment are not to ship the ordered items until visited by the purchaser's safety personnel, who are to sign off on acceptance.

PREVENTIVE MAINTENANCE

The quality of maintenance obviously impacts greatly on hazards management. It sends messages to the entire staff, informing them of the reality of a company's intent to keep or not to keep physical hazards at a minimum. While maintenance departments also struggle to get things done with slimmer staffs, safety professionals with whom I recently had discussions say that their companies have not experienced the problem of having hazardous situations given a low priority by maintenance staffs.

Visit a location where the culture demands good safety practice and immediately, from the appearance of the exterior premises, you will get a "feel" for the quality of maintenance. That isn't necessarily an absolute indicator, but the opposite is almost always true; if the exterior of the premises is shabby, safety maintenance will likely be inadequate. In the best operations, cleanliness is truly a virtue, maintenance schedules are adhered to, and personnel are encouraged to report on and seek elimination of hazards.

Consider this situation for an opposite and real picture. A safety professional is making an audit of the quality of hazards management. The maintenance superintendent displays an elaborate computer-based maintenance program, of which he is very proud. During the plant tour, many hazardous conditions are observed. A supervisor is asked why work orders aren't being sent to the maintenance department to have those conditions corrected. And the response is, "We don't do that anymore. Safety work orders are the last priority for the maintenance department." Later it is determined that a great number of safety-related work orders are over six

months old. But the maintenance program, on paper, was supposed to prevent that sort of thing from happening.

A negative message is delivered in a situation of that sort. If the staff is to believe that hazards management is to be taken seriously, management must maintain a safe environment and continuously demonstrate its commitment to do so.

SAFETY COMMITTEES

Although many articles questioning the value of safety committees have been written, in entities where superior results are expected and achieved, safety committees are made to work. For the superior performers, it is a common practice for the management committee to also serve as a safety committee, with safety being an early item on meeting agendas.

Safety committees exist at several levels in the model companies. Where they are programmed to achieve, they do the following:

- Serve as a means of communicating that hazard prevention and control is important within the organization's culture
- Provide opportunity for participation in safety efforts by a large number of employees
- Can be structured to allow greater employee involvement and upward communication
- Are well-organized
- Have clearly understood purposes
- Find that their recommendations are seriously considered and resolved at appropriate management levels

Where safety committees are effective, they add to the element of trust, from the top down and the bottom up. Surely, if they are not effective, their existence can further the belief that management is not serious when it says it is concerned about safety.

SUPERVISORY PARTICIPATION AND ACCOUNTABILITY

Supervisors in the top performers are conveyors of the element of trust between management and operations employees. Participation by supervisors in hazards management directly reflects the perception their superiors have of what the organization's culture expects and what they understand to be the actual performance measures.

Supervisors will do what they perceive to be important to their superiors. If their superiors convey, by what they do, that hazard prevention

and control is important, be assured that supervisors will so respond. If supervisors are held accountable for the prevention and control of hazards, success will result.

Expectations of supervisors, by their superiors and by society in general, have unfortunately become complex and difficult to attain — which means that supervisors must have a sound support structure to be successful. That support structure begins with the location manager and the staff immediately subordinate to the manager. It includes depth of training, a good communication system on hazards, up and down, and the resources of qualified safety professionals as consultants.

TRAINING

In companies with superior safety records, training is serious business. Unfortunately, safety training is often much talked and written about but poorly done. Senior management in the model companies is well-trained. It all starts here. All levels of management become aware of the risks of their businesses and acquire the necessary knowledge of the hazards management needs. They cannot be role models and provide the necessary leadership if they are not schooled in how the hazards management job is to be done.

Training takes place in many ways — in formal classroom settings and on the job by demonstration and observation. It is a continuing and never-ending process.

Safety training must be well-planned, continuous, and measured for results. Supervisors and employees have to believe that the content of the training program is what management expects them to apply, and that it serves real knowledge and skill requirements.

Employees cannot be expected to follow safe work practices if they have not been instructed in the proper procedures. They need to understand when they begin employment that they have entered an organization that gives high priority to safe performance. It's typical to have a very thorough indoctrination procedure for new employees. As they pass through indoctrination and are assigned to a supervisor, they are able to evaluate the level of safety expected very quickly.

Too much emphasis cannot be given to the importance of the supervisor in employee training, or to the priority given to training in those companies where successes in hazards management are noteworthy. Supervisors, as well as experienced employees serving as lead persons, are the role models that new employees will follow.

But consider this situation as representative of a reality that is too prevalent. Early during a safety audit, an industrial relations director proudly

reviewed with the auditor a marvelous indoctrination and safety training program for new employees. During the audit, an interview was arranged with an employee who had been in the shop for about three months. The intent was to determine what he thought of the indoctrination and safety-training program.

His response was, "What indoctrination and safety training program?" This employee had bid up to his third job, had never gone through the indoctrination and safety training program, complained that he never saw his supervisor, and didn't know how to get anyone to pay attention to gear box covers that had been removed and not replaced. Situations of that sort define the organization's culture for hazard prevention and control.

Training needs are always in transition, and recent developments require different emphases. Safety professionals interviewed spoke of these situations.

- New technology is continuously developed that may not have been evaluated for safety. Thus, safety professionals are more often engaged in preoperational hazards analyses, job hazard analysis, and the additional training that those analyses indicate is necessary.
- It is more common for employees with seniority to be assigned new jobs without adequate training, and that requires particular attention by the safety staff.
- Demographics and the greater differences in spoken and written languages in the changing work force stretch training capacity to its limits.

Overall, safety professionals say that it has become very difficult to keep up with training needs. Safety training, given as a substitute for other hazard prevention and control actions that should be taken, will be recognized as the deception it is. Several authors have cautioned that employers should not consider safety training as the primary method for preventing workplace incidents. That premise is sound. Rather, when considering hazards, the first course of action should be to determine whether they can be eliminated through workplace and work methods redesign. Training will be less effective if known hazards are not corrected. If those hazards continue to exist, the purposes of the training initiative will be questioned.

EMPLOYEE INVOLVEMENT

Safety professionals in the superior performing companies agree that effective employee involvement builds confidence and trust in the organization,

develops more enthusiastic and productive employees, and supports the position that all are working together to achieve understood objectives. Employees must believe that they also are responsible for their safety, and they must be provided with the training, tools, and the necessary authority to act.

Given the necessary training and opportunity, employees can make substantive contributions in hazard identification, in proposing solutions to problems, and as participants in applying those solutions. Safety and health initiatives obviously are more effective if employees have "bought into them."

As an example, practitioners in ergonomics tell countless stories of work practice innovations originating from first-line employees. Many are easy to apply, inexpensive, and effective, and they often result in greater productivity. There is an asset here, in effective employee involvement, that could be better utilized to achieve more effective hazards management.

CONTROL OF OCCUPATIONAL HEALTH HAZARDS

A major emphasis of OSHA since its beginning has been the control of occupational health hazards. These high-performance companies have given the subject priority attention. Each of the safety professionals interviewed for the third edition of this book say that their companies are operating well below worldwide permissible limits with respect to occupational health hazards. Surely, keeping occupational health hazards at an acceptable risk level is a must, even though expenditures to control health hazards can be great.

ENVIRONMENTAL CONTROLS

As a matter of good citizenship and because of concerns over costly penalties that might be imposed by the environmental agencies in the countries in which a company does business, avoiding environmental incidents often gets greater senior management attention than other aspects of hazards management. It is common in the best situations for those responsible for environmental affairs to have senior-level credentials, and they have management support to achieve.

SAFE PRACTICE STANDARDS

A safety initiative cannot succeed without soundly established and implemented safe work practices. How well that's done is another reflection of

an organization's culture. It is understood in superior performing companies that establishing, communicating, and implementing prescribed work practices is to be taken very seriously at all employment levels. Developing safe practice standards more often includes some form of employee involvement through which their input is sought. These work standards become the substance of training programs and of expectations by supervisors.

INSPECTION PROGRAMS

Well-managed inspection programs will exist at several levels where hazard prevention and control is managed best. They have many purposes, one of the most important being that they display and communicate management's determination that hazardous conditions and practices are to be identified and corrected. They also provide meaningful opportunities for participation by a cross section of all employment levels. No inspections are more effective than those in which senior executives participate. Correcting observed hazards is a demonstration of the culture. Failure to follow through, of course, gives negative messages.

INCIDENT REPORTING AND INVESTIGATION

For several reasons, greater emphasis is being given to incident reporting and investigation in the model companies with which discussions were recently held. What gets done when a hazards-related incident occurs is one of the major influences that determine how the staff "reads" what level of hazards management is really acceptable. Do it poorly, and poor readings are inevitable.

How does it get done well? Management has to be a part of the accountability system for incident investigations. In one company, the plant manager is expected to participate in at least 10% of incident investigations. In another worldwide company, the location manager (not the safety director) must report to headquarters within 48 hours on any injury resulting in a lost workday.

Far greater use is being made of incident investigation teams. Safety professionals say that the time expended by those teams is a worthwhile investment since the activity communicates management's intent to avoid hazards-related incidents. Over time, large numbers of personnel are involved.

Absolutely, there has to be a documented incident reporting and investigation procedure. But, that's not enough. It's recognized in the model companies that specialized training is necessary to achieve sophistication

in incident investigation. Incidents don't occur in a given area very often, and those who investigate them have limited investigation experience. Thus, the necessary training must be repeated.

Most importantly, results of investigations and the actions to be taken concerning causal factors are publicized. Quality of incident reporting and investigation required or tolerated is a principal measure of the accountability system, and of the culture of which the accountability system is a part. It's very difficult to achieve effectiveness in other aspects of hazards management if corrective action is not taken concerning the causal factors for the incidents that do occur.

RECORDING, ANALYSIS, AND USE OF INCIDENT DATA

If the accountability system is to work, there has to be an effective incident information-gathering and analysis system. Those systems are effective in the model companies. Performance reviews that hold management personnel accountable for meeting or not meeting agreed-upon goals rely on these systems. Also, the analytical data produced is vital in determining where hazard prevention and control emphasis needs to be given.

PERFORMANCE MEASUREMENT

Data produced by the incident recording and analysis system are, of course, a principal aspect of performance measurement. But, additional proactive measurement and communication systems are used in the model companies — such as those discussed in Chapter 24, "Measurement of Safety Performance."

Because of the emphasis given to them in discussions with safety professionals, two performance measurement systems deserve further comment. Scheduled safety audits are performed in every superior performing company. Through a formal process, they provide management with a determination that expectations are or are not being met. In that process a systems aura prevails — an aura of plan, do, check, and improve.

And, for performance, those companies benchmark with others in similar businesses, formally and informally. They publish and exchange statistics on incident experience. Through their trade associations and professional society meetings and publications, they explore ideas on how safety can be improved.

MEDICAL AND FIRST-AID FACILITIES

At both a corporate and at a location level, medical and first aid facilities are superior where a sense of responsibility to employees permeates the culture.

EMERGENCY AND DISASTER PLANNING

Those companies dedicated to protecting its employees and their communities provide the resources necessary to establish and maintain sound emergency and disaster planning. But, with sympathy, it needs to be said that it's very difficult to put in place and maintain activities that are seldom used. Expectations of emergency and disaster plans cannot be fulfilled without regularly testing their ability to deliver. Establishing communications with the community resources is necessary, without which the actions expected when an emergency occurs will not take place. Training and practice requirements are considerable.

Many companies have reviewed and updated their emergency and disaster plans since the World Trade Towers event. In the superior performing companies, which have extensive security departments, the safety professionals were impacted and participated in the updating, but most of the work fell to the security staff.

For safety practitioners in smaller companies, the involvement in security may be much greater. To assist at that level, the National Safety Council issued a revision of its publication *On-Site Emergency Response Planning Guide*. For response planning, it's quite good. For emergency and disaster prevention purposes, including terrorist activities, the help of a consultant may be needed.

COMPLIANCE WITH GOVERNMENT REGULATIONS

While last in this chapter, compliance with government regulations is important at a corporate level, and the needed attention to them percolates down through entities that are to maintain a top quality of hazards management. But, compliance programs do not determine operating standards. It's common in the best situations for government regulations to be considered basic standards, with actual design and operating requirements exceeding them.

SUMMARY

Listings of the elements of successful safety management systems most always commence with management commitment and involvement. One could argue that management commitment and involvement is not an element to be placed on a par with other elements in the listing. Rather it is the foundation, reflection, and extension of the organization's culture from which all hazards management activities derive. Management involvement and commitment is absolutely required.

In entities that have achieved outstanding safety records, all employees *know* that management is held accountable, is involved, and holds subordinates responsible for their results. If incident experience is considered to be unsatisfactory by management, safety professionals should promote, with great tact and diplomacy, the asking of the obvious but difficult questions. Has that experience resulted from an absence of management commitment to hazard prevention and control? Has the adverse experience been programmed into operations, by implication?

It is impossible for superior safety performance to be attained if executive personnel do not display, by their actions, that they intend to achieve it. Management is what management does. What management does establishes the organization's culture. If what management does gives positive impressions, it is more than likely that a safety initiative will succeed.

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