By DAN PETERSEN

In the past five years, the safety profession has witnessed an explosion of information on behavior-based safety (BBS). The topic has generated much interest—and considerable controversy. Many of the articles published praise the approach, with some suggesting that BBS is the "future of safety."

Throughout safety's history, many different approaches have emerged, some heralded as the future of safety. Key among them:

- Physical Condition (1911 to present)
- Industrial Hygiene (1931 to present)
- "Unsafe Act" (1931 to present)
- Management (1950s to present)
- Noise Control (1954 to present)
- Audit (1950s to present)
- System Safety (1960s to present)
- OSHA Physical Condition (1971 to present)
- Ergonomic approach (in anticipation of OSHA standard)
- Safety Program approach (in anticipation of OSHA standard)
- Total Quality Management/Statistical Process Control approach.

None of these approaches were fads; they were genuine attempts to control losses. Elements of many are still present as part of the overall safety technology. They represent the many layers of activities that must be accomplished. Therefore, as safety staffs continue to shrink, management staffs dwindle and employee ranks are downsized, the key questions are, "Which layer should we work on today?" "If the behavior-based layer is the one, which layer should be ignored?"

This is how safety has evolved. To a large degree, however, safety efforts are governed by external forces—factors that exist outside the profession. For example:

- Legislative changes dictate what must be done. New laws at the federal, state and local levels emerge almost daily.
- Laws that do exist may be enforced in various ways (e.g., issuance of "guidelines" with enforcement under the General Duty Clause).
- Criminal liability potential exists at the federal, state and local levels.

Safety professionals are also influenced by changes *within* organizations. Companies are managed much differently today than 50, 40 or even 10 years ago. For example:

- Computers have revolutionized the workplace.
- Theory X and Y concepts have changed how managers deal with people.
- MBO concepts have shifted decision making to lower levels within firms.
- Management styles have changed.
- Situational leadership has transformed the concept of how managers are managing (e.g., one-minute manager concepts of the 1970s).
- Theory Z and Japanese management of the 1980s; Deming's philosophies; and re-engineering, self-directed work teams and employee ownership have each had an impact on how business is managed.

Management has changed because the

The "Other Voices" feature section of Professional Safety *serves as a forum for authors with distinct viewpoints. Opinions expressed are strictly those of the author(s). Although* Professional Safety *does not necessarily endorse these opinions, we hope they will stimulate healthy discussions on matters of vital concern to the safety and health profession.*

external environment is different, and the internal environment has undergone at least three major evolutions—from classical management to human relations management to situational management.

Over this time, safety management has learned some things about:

- **Accident causation.** Safety has moved from the domino theory which stated that accidents are caused by unsafe acts and/or unsafe conditions, to newer theories which suggest that accidents are caused by a combination of management system failure and human error; furthermore, human error is often caused by a management-created environment that rewards risk-taking.
- **Accident control.** Safety has moved from the standard "safety program" to recognition that no one right way exists. In fact, research and benchmarking studies demonstrate that:
  - Management is the key.
  - Culture dictates what works.
  - Certain criteria must be met to create a world-class organization—and achieve safety excellence.

However, a discrepancy exists between these facts and actions taken.

- Although management is the key, many behavioral approaches focus on employees. This allows management to abdicate its responsibility for safety.
- Although no universal safety strategy exists, OSHA is pursuing a standard safety program that fits all organizations.
- Although culture dictates success, many organizations make no effort to assess this issue.
- Although accident statistics are often invalid, management relies on them.

THE BEHAVIORAL APPROACH

In 1970, Bird and Schlesinger introduced the concept of "safe behavior reinforcement" to the safety profession (16+). These authors did not invent the concepts, they merely borrowed them from the field of psychology and suggested their potential application to safety.

Behavioral concepts had actually been introduced even earlier. The concepts stem from the works of John Watson, a psychologist who wrote about "behaviorism" as early as 1910; Ivan Pavlov, who experimented with "classical conditioning" in the 1920s; and B.F. Skinner's "operant conditioning" concepts of the early 1940s.

Watson insisted that psychologists should concentrate on "observable" behavior; thus, he provided the foundation for BBS. Pavlov experimented with pairing two stimuli to show how, over a period of time, behavior can be influenced simply by words. Skinner showed that behavior can be changed (thus the term "behavior modification") by attaching a consequence that immediately follows the behavior (preferably a positive consequence). Edward Feeney applied behavior modification concepts to industry in the early 1950s. In fact, he and Skinner produced training materials to show how these concepts could be used to increase productivity, reduce customer complaints and improve absenteeism rates.

Although current research shows that management is the key, many behavioral approaches focus on employees. This allows management to abdicate its responsibility for safety.

Over the years, safety practitioners have examined behavior as part of the safety problem. In 1931, Heinrich suggested that 88 percent of all accidents are caused by unsafe acts of people, pointing out that management must focus on behavior in order to control accidents. Many professionals agreed, yet took little action—other than to train and discipline; in effect, the knowledge from Watson, Pavlov and Skinner was simply ignored.

Some behaviorally sound approaches were used as early as the 1960s. Pollina discussed "safety sampling" in 1962 and showed how to measure behaviors using quality control concepts (19+). The technique had been used successfully in heavy manufacturing plants, but it is rarely used today.

In "Attitudes Affecting Line Managers," published in 1968, I discussed a management model developed by Lawler and Porter in 1967; the model demonstrates that managers' and supervisors' performance in safety is determined by how their various roles have been defined, how they are measured and how they are rewarded (Petersen 10+).

During the 1960s, safety professionals had access to the knowledge derived from research in humanistic approaches to obtaining desired behaviors. Argyris showed that when adult human needs are met, behavior is influenced positively. Herzberg suggested that most people respond to achievement, recognition, responsibility and other so-called "motivators" (109+). The behaviorists' knowledge that behavior is modified by the consequences of that behavior was also available. Yet, few in safety used this knowledge.

In 1967, I wrote *Techniques of Safety Management* (published in 1971), which covers these topics. Around that time, the OSH Act took effect. In my opinion, this legislation pushed safety back down the "unsafe condition" path, effectively delaying application of behavioral strategies for many years.

The point of this history is that the fundamentals of BBS have been known for almost 90 years, used in industry for 50 years and applied to safety (at least by some practitioners) for 30 years.

Today, BBS is popular. It is the topic of many seminars, symposia and conferences. Often, BBS approaches are presented as new knowledge—as new concepts. Some concentrate on "culture building," others emphasize employee observations. But no BBS approach is truly new. All are based on long-known (and available) information.

THE GOOD AND THE BAD

Many of today's approaches are excellent and long overdue, but some are counterproductive—and even dangerous.

Which approaches are excellent and overdue? Safety professionals are finally using the knowledge of the past. In some cases, cultures are being measured and built—recognition that culture *as perceived by employees* dictates which elements of a safety system will work and which will not. In other cases, safety managers are finally concentrating on unsafe behaviors—observing them and intervening.

These activities should have been occurring from the start. When Heinrich said that 88 percent of all accidents are caused by unsafe acts, safety profession-

als should have looked to Watson, Pavlov and Skinner to learn how to best reduce the probability of these acts. Despite these lost years, the current focus on behavior truly is a breakthrough for safety—and should be a wave for the future.

Which approaches are counterproductive? In many organizations, BBS strategies that emphasize peer observations have shifted the entire safety effort to hourly employees. As a result, management has relinquished its responsibility. As research and benchmarking demonstrate, this cannot be allowed. The overall focus must remain on management.

In some cases, BBS is perceived as "the safety program," which allows other crucial elements to wither. For example, results of peer observations may not be measured; consequently, site management simply does not know whether behaviors have improved. Or, the results are measured by the number of "cards" generated, with no valid measure of the reduction of unwanted behaviors.

The typical outcome is more paperwork and fewer results; this leads to an even wider chasm between management and the workforce. Such changes are dangerous. Safety can only be achieved when both management and hourly employees work together—when confidence and trust exist between them—and perceive safety to be a value, not a priority subject to shifts depending on other circumstances.

Another counterproductive trend is that the old safety mythology (which management never *really* understood) has been shed for a new BBS mythology (which management does *not* understand). New terminology is applied to the "same old stuff." In some cases, the experience that has evolved into safety rules, safe operating procedures and job safety analyses is simply thrown out in the process of developing critical behavior inventories.

Often, such inventories contain only the most frequently occurring behaviors; they ignore the less-frequent behaviors that often lead to severe injury. As has long been known, the "causes" of the severe (the catastrophic) are different than the "causes" of the minor and frequent.

In other cases, much time is spent training people to do what they already know how to do; this removes them from the production floor and forces those remaining to produce even more work. In many organizations, the result has been the creation of three tiers—management, involved workers and non-involved workers—instead of the traditional two (management and workers). The friction between the tiers remains the same.

WHERE ARE WE HEADING?

Many organizations now recognize that downsizing, pressure-building and stress-causing management concepts have gone too far. Consequently, some are adding people; others are examining culture building. Cost-containment remains critical, however, so any new initiatives must be shown to add value.

In *Measures for Manufacturing Excellence,* Kaplan discusses the necessity for any organization to critically assess any product (or function) and:

1) Identify externally focused measures of how the product (or program) gives value to the customer and supports the organization's goals. In safety, this requires new measures—in both safety and accounting.

2) Identify activities that cause work on the product line and assess how each adds value or creates waste. A list of such activities enables an organization to identify what type of activity consumes resources, yet adds no value. In safety, such activities are many.

3) Identify and eliminate generators of work that cause non-value activities. The first step is to eliminate the top five such activities. Could any be "safety activities"?

All elements of a safety system should be subjected to these tests—including behavior-based functions. Good companies currently do so—and eventually, most will be forced to do so. This will affect the future of BBS. If a behavior-based system adds value, it will remain; if it creates waste, it will not.

This requires externally focused measures (statistically valid safety sampling upstream, perception surveys and reduced costs downstream). Some programs will survive, others will not. If BBS is perceived as a "program," it has no future. If perceived as "the way we manage," it will survive. If it narrows the chasm between management and workers, it will survive.

In the author's opinion, many current BBS systems would fail these tests. Some stand out like shining stars because they are an integral part of the way the organization is managed. Others stand out simply because they no longer exist. Many others will disappear because they cannot survive Kaplan's three tests. ■

REFERENCES

Argyris, C. *Integrating the Individual and the Organization.* Somerset, NJ: Transaction Publishers, 1964.

Bird F. and L. Schlesinger. "Safe Behavior Reinforcement." *Journal of the ASSE.* June 1970: 16-24.

Heinrich H., D. Petersen and N. Roos. *Industrial Accident Prevention.* 5th ed. New York: McGraw Hill, 1980.

Herzberg, F. "One More Time: How Do You Motivate Employees?" *Harvard Business Review.* 65(1987): 109-120.

Kaplan, R. *Measures for Manufacturing Excellence.* Boston: Harvard Business School Press, 1995.

Lawler E. and L. Porter. *Attitudes Affecting Line Managers' Performance.* Berkeley, CA: Institute of Industrial Relations, University of California, 1967.

Petersen, D. "Attitudes Affecting Line Managers' Safety Performance." *Journal of the American Society of Safety Engineers.* May 1968: 10-12.

Petersen, D. *Techniques of Safety Management.* New York: McGraw Hill, 1971.

Petersen, D. *Safety Management: A Human Approach.* New York: Aloray Publishers, 1975.

Pollina, V. "Safety Sampling." *Journal of the American Society of Safety Engineers.* Aug. 1962: 19-22.

Skinner, B.F. *Science and Human Behavior.* New York: McMillan, 1953.

Watson, J. "Psychology as the Behaviorist Views It." *Psychological Review.* 20(1913): 158-177.

Dan Petersen, *Ph.D., P.E., CSP, is a consultant specializing in safety management and organizational behavior. He holds a B.S. in Industrial Engineering, an M.S. in Industrial Psychology and a Ph.D. in Organizational Behavior. A frequent author and speaker, Petersen is a professional member of ASSE's Arizona Chapter and a member of the Society's Management Practice Specialty Division.*