The methodology known as behavior-based safety (BBS) has been around for some years. As with all things that become popular, the name has come to mean different things, depending upon whom you ask. What is not disputed is that in certain forms and in the right configuration, the approach can produce exceptional results. Used along with good engineering and administrative controls, behavior-based safety can be a powerful tool for achieving continuous improvement in safety performance.

This article outlines BST’s approach to employee-driven safety, the Behavioral Accident Prevention Process® (BAPP®) technology. BAPP safety is a flexible, systematic, and comprehensive method for improving workplace safety. It focuses on exposure upstream of injuries and is proven to produce sustainable results and meaningful employee engagement.

What Causes Injuries?
Understanding the Working Interface

The primary activity of safety initiatives, whether at the site or corporate level, is to reduce the level of exposure that occurs in the workplace. All safety activities, mechanisms, programs, and measures are inherently linked to this fundamental task. Even with good measures in place, however, many companies still see that injuries continue to persist, sometimes inexplicably. This persistence results, in part, from a misunderstanding about what creates exposure and how safety performance occurs within the organization.

It has been fairly common until somewhat recently to view incident causation as “either” the employee behavior “or” equipment and facilities. This paradigm contains a false dichotomy, and has limited the scope (and consequently the reach) of safety efforts. Equipment doesn’t simply malfunction independently of how it has been designed and maintained. Workers don’t merely work unsafely, isolated from the system configuration. Rather, workers interact with technology (see Figure 1). This interaction constitutes a system, which we call the working interface. This system has a multitude of variables influencing it, including facility and equipment design quality, the relevancy and adequacy of training, the quality of leadership on site, and the climate and culture of the workplace.

Behavior-based safety (BBS) is concerned with assessing the working interface by using what people do—behavior—as the starting point for improving the whole system in which people work. We look at how the work is done, not because the worker is to be blamed but because real safety improvement occurs through discovering how things actually occur in the workplace, not how they are “supposed” to be. This means identifying and defining, in operational terms, the critical interfaces associated with how the equipment is used or how procedures affect risk. Behavior-based safety that focuses on the working interface allows organizations to pinpoint where they need to direct improvement resources in advance of any incident.
Four Key Elements

Behavior-based safety or BBS is a mechanism for understanding, influencing, and changing the working interface. Since the approach first rose to prominence 20 years ago, “behavior-based safety” has come to describe any effort that focuses some level of attention on safety-related behaviors. It’s not unusual to hear people claim to have behavior-based safety meetings or say that their incentive programs are behavior-based. These activities, however, bear little resemblance to the BBS systems that studies have shown to produce robust and significant safety gains over the course of many years.

The foundational principle of BAPP technology is that safe work is made up of a complex interaction of a multitude of factors (BST’s Ongoing Studies, March 2001). A true BBS system contains four basic elements (Figure 2): Critical behavior identification, definition, and communication; Data gathering (sampling or observations); Real-time feedback; and Using data to remove barriers to safe work.

**Identify Critical Behaviors** • In this step, a steering team reviews a representative selection of the site’s incident reports looking for the behaviors critical to safe performance. It is common for the team to discover a set of 20-35 behaviors that is implicated in 90-95% of recent incidents. Wage-roll team members — who are most familiar with the daily risks of the job — will sometimes identify additional behaviors which may not be implicated in incident reports but which they know to be critical to worker safety. Committee members then define each of the identified behaviors in operational terms and categorize them for inclusion in a data sheet. Operational definitions might focus on areas such as pinch-points, line-of-fire, eyes-on-path, and 3-point-contact on ladders or stairs or scaffolding.

**Gather Data** • Trained observers use the data sheet to measure the level of exposure to risk in the workplace. The operational definitions not only provide an objective measure of safe performance, they help foster a new common vocabulary for safety. While many sites train supervisors in behavior-based observation procedures, the observer corps at most sites is comprised largely of wage-roll personnel. They perform regular observations of their peers, after which they provide performance feedback.

**Real-time Feedback** • After gathering data, observers have informal discussions with their coworkers about the safe and at-risk behaviors they observed. The observer points out the places where the employee was performing safely (providing success feedback) and tries to discover the reasons behind any observed at-risk behaviors. The observer records co-worker suggestions (without recording the employee’s name) and ideas about barriers to safe work. Data recorded in the observation is then analyzed by computer software. Posted reports and charts of workgroup performance provide additional ongoing feedback.

**Use Data to Remove Barriers** • Perhaps most critical to improving the working interface, barrier removal uses observation data to target those areas where workers are exposed to risk. A cross-functional barrier removal team uses the observers’ written comments to identify the number and kinds of remedies needed. Keeping in mind that there are three basic categories of behavior that make up the pool of exposure—enabled, non-enabled, and difficult—the barrier removal team can tailor interventions appropriately. In the case of enabled behaviors, (those that are easily within the control of the worker) the team may rely on ongoing feedback or training sessions to increase the occurrence of safe behavior. In the case of non-enabled (impossible for the worker to perform) or difficult (requiring extra effort), the team will work with management to remove barriers in systems or equipment that are exposing workers to risk.

Figure 2. The BAPP System Contains Four Key Elements
Roles for Every Level

The working interface is not an isolated system. An organization’s safety enabling systems, sustaining systems, culture, and leadership all influence the level of exposure at the working interface. For this reason, successful BBS initiatives engage all levels of the organization in safety and in removing hazards.

**Front-Line Employees** • In many organizations, BAPP safety offers the first real opportunity for front-line employees to contribute to safety. Typically front-line employees are responsible for running the process, from conducting observations to running meetings to data analysis and supporting action plans where necessary. Successful organizations ensure that key individuals have adequate training for their role. This training is typically interaction skills and behavior-based principles for observers and more specific time management and organization skills for team facilitators.

**Supervisors & Team Leaders** • Supervisors have the most influence over day-to-day activities that affect performance outcomes. While some sites do allow supervisors to conduct observations, most have supervisors take a supporting role, providing work coverage so employees can conduct observations, and assisting in barrier removal action plans. Some organizations are providing supervisors and team leaders with training in performance management skills to help them work with employees to meet overall safety objectives.

**Senior Leaders & Managers** • Research shows that one of the most critical factors in the success of any safety initiative is leadership. Through what they choose to focus on and how they go about doing the things they do, leaders telegraph what is really important to the organization. Typically not engaged in on-the-floor observations or barrier removal, senior leaders can still set the stage for BAPP safety success by fostering a healthy organizational culture. Site managers can get more directly involved by becoming process champions or by helping with action plans to remove barriers to safe behavior. Many leaders and managers are also engaging in directed coaching that helps them leverage their actions for optimum effect throughout the organization.

Planning, Assessment, Implementation, and Support

BST professionals offer guidance at each stage of the BAPP safety implementation with a view to building the client company’s internal resources for long-term sustainability. Implementation begins with the use of predictive assessment tools that diagnose organizational culture, strengths, and challenges, helping the client avoid pitfalls and build success from the outset. BST assists with selecting a process facilitator, involving supervisors and managers, and managing upstream data. After the start up phase, BST resources are available to offer support as the implementation matures, including report analysis training and data services, internet resources, sustainability reviews, and admission to BST Users Conferences around the world.

Results

BAPP initiatives enjoy a long history of success. Figure 3 shows the results of the largest study ever conducted demonstrating the effectiveness of behavior-based safety; however, the results are specific to BST and BAPP safety and do not generalize to all employee-driven approaches. Based on a representative sample of 153 user sites, it shows that the average user site achieves a 25% improvement over baseline in the first year of its process, increasing to 55% improvement over baseline in the fifth year. The top 25% of users achieve better than 45% improvement over baseline in the first year, increasing to 72% in the fifth.

![Figure 3. Five year results of BAPP technology for 153 client sites.](image-url)