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**BEHAVIOR-BASED SAFETY**  
Process Requirements

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## PUBLISHING AND COPYRIGHT INFORMATION

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This file was written and published by AARBA-CCBS.

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CCBS – Cambridge Center for Behavioral Studies ([www.behavior.org](http://www.behavior.org))

Any changes in the B-BS Process Requirements are subject to the approval of the AARBA-CCBS Scientific Committee and a previous reading of the Stakeholder Committee.

A list of the organizations represented on the Stakeholder Committee can be obtained on request to AARBA secretary.

## CONTRACTUAL AND LEGAL CONSIDERATION

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All over the world there are various legal requirements for occupational health and safety. The respect of B-BS Process Requirements and the consequent Certification is not sufficient to comply with the international and national legal requirements.

Users are responsible for the correct application of the B-BS Process Requirements

Compliance with the B-BS Process Requirements does not exempt from legal obligation.

A company complying with these B-BS Process Requirements but with unsafe or worsening safety indexes will not be recommended for certification by the Certification Body Technical Committee.

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## STAKEHOLDERS

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## INTRODUCTION

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### HOW TO IMPROVE BEHAVIORS AND TO GET SAFETY RESULTS

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Behavioral Safety is the application of behavior analysis principles and paradigms to the problems of safety in the workplace. This means that any safety program labeled as a behavioral safety program must meet the standards defined by the science of behavior analysis.

There are hundreds of methods that claim to consider human factor for safety; most of them are not sufficiently supported by published evidences of efficacy. Among them, Behavior-Based Safety can claim - on the other hand - to have hundreds of published case reports and tens of 3<sup>rd</sup> level of Randomized Control Trials.

This premise is necessary to clarify that these documents only define requirements for a B-BS process, whose effectiveness has been already supported by experimental evidence. Within the Scientific Community, experiments and statistical meta-analysis establish whether a model, a process or a protocol is right or wrong, true or false. This is the reason why these requirements will be updated once every two years in order to keep this list consistent with the most recent scientific findings.

These Certification Requirements are supposed to verify the sustained operations of a B-BS process, i.e. data driven process, which lead to safety results: pinpointing, measuring, and reinforcing desired performance. <sup>1</sup>

These B-BS Certification Requirements are necessary to avoid the risk that certification bodies auditing and assessing B-BS process that have nothing to share with Behavioral Science Findings.

A company complying with these B-BS requirements but with severe or worsening safety indexes will not achieve the certification, according to the evaluation of the Certification Body Technical Committee.

Behavioral Safety is the application of behavior science to occupational safety. The goal of Behavioral Safety is to establish and maintain safety practices and make the work environment as safe as possible. This involves constant assessments of the working conditions, knowledge about the work to be done and work processes (i.e., standard operating procedures), motivation of the personnel, effectiveness of management strategies to show the value of each individual in the organization for safety, etc. Behavioral Safety also involves a set of principles and techniques that are used to improve safety behaviors at the level of individuals with measurable improvements in safety outcomes at the level of the organization. <sup>2</sup>

It is estimated that more than 80% of on the job injuries are due to unsafe behaviors, rather than to wrong devices or unsafe conditions. Behavior Based Safety is a unique discipline that relates behavioral factors in getting work done safely through the scientific principles of behavior analysis with demonstrated behavior change producing measureable reduction in accident rates. Data-driven behavior management systems are the main reason why B-BS is so successful in accident reduction, illness prevention and environmental protection.

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<sup>1</sup> Komaki (2010), 4<sup>th</sup> European B-BS Conference, Venice

<sup>2</sup> From [www.behavior.org](http://www.behavior.org), the Cambridge Center for Behavioral Studies official site

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## TERMS AND DEFINITION

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Hereinafter some definitions are provided in order to avoid misconceptions and misunderstandings

**Accident:** an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage, injury or fatality.

**At-Risk behavior:** behavior that may produce an accident and then an injury or worse.

**At-Risk Condition:** any environmental factor that can produce an accident and then an injury or worse.

**Behavior:** essentially whatever a person can say and do.

**Behavioral checklist:** the list of those safe behaviors important to prevent accidents in a specific organization, typically these are informed by subject matter experts, workers, managers, and data on previous accidents

**Celebration:** team amusing event following the achievement of a specific safety goal.

**Consequence:** a stimulus that follows a behavior.

**First aid:** a treatment provided after a little injury that does not require visit to a hospital or medical facility.

**Formal punishment:** any official disciplinary measure addressed to workers for certain non-compliances (e.g. warning letter, fines, suspension, firing, etc.).

**Lost Time Injury (LTI):** a work-related injury or illness that results an individual is unable to work on a subsequent scheduled work day or shift.

**Fatality:** an occurrence of death by accident, in war, or from disease.

**Near Misses:** a near miss is an unplanned event that did not result in injury, illness, or damage but witnesses determine to posed risk of negative outcomes.

**Observation:** the activity of watching people at-work; reporting their behaviors as *safe* or *at-risk* and comments on a checklist, and providing the feedback about their safety conditions.

**Observer:** any employee observing people at work through the behavioral checklist.

**Punishment:** a consequence able to decrease the likelihood of that behavior in the future.

**Reinforcer:** a consequence able to increase the likelihood of that behavior in the future.

**Reward:** any material compensation (e.g. money, goods, benefits, gadgets, etc.) provided for an achieved safety goal.

**Risk:** a situation involving exposure to danger.

**Safe Behavior:** a behavior that prevent an accident and then an injury.

**Safe Condition:** any environmental factor that can prevent an accident and then an injury.

**Safety Meeting:** periodical and fixed reviews with workers hold by their Safety Leader discussing safety results, objectives, behaviors, conditions.

**Safety Leader:** anyone who has the responsibility of maintaining a B-BS process for his/her team of workers.

**Steering Committee:** A group of people in charge of supervising the B-BS process. Usually this involves setting goals, planning interventions, gathering data, and analyzing results.

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## GENERAL REQUIREMENTS

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The organization shall establish, document, implement, maintain, collect data and continually improve a B-BS Process in accordance with the B-BS requirements described in the present document and determine how it fulfill these requirements.

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## B-BS POLICY

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The management shall define, document and authorize the organization's B-BS policy and mission and ensure that within the defined scope of B-BS Process:

- a) includes a commitment to prevention of injuries and illness and continual improvement;
- b) is communicated to all persons working under the control of the organization with the intent that they are made aware of it;
- c) define the main activities the organization does and supports;
- d) define the objectives of the B-BS Process in order to be periodically verified;
- e) is reviewed periodically to ensure that it remains relevant to the organization;
- f) define the areas and departments involved in the B-BS Process;
- g) defines behavioral measures and outcome statistics (e.g., incidence rates)
- h) define the schedule of the reviews for verifying the achieved results.

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## PLANNING

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### SAFETY CONTINUOUS ASSESSMENT AND DOCUMENTATION

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The organization shall identify and document all hazards after an analysis of its activities and risks.

The organization shall record and document all injuries and accidents occurred in its facilities, including near misses, first aid interventions, lost time injuries, injuries producing permanent damages, fatalities.

The data have to show improvement or sustained maintenance of safe behavior and outcomes.

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### OBJECTIVES AND PLAN

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The organization shall establish implement, document and maintain a plan for achieving its B-BS objectives.

The plan shall include as a minimum:

- a) designation of accountability of B-BS process activity at relevant functions and levels of the organization (e.g. conduction of observations, providing paper checklist at dept. level, entering data in the system, conducting review meetings with workers, etc.)
- b) designation of accountability and authority for achieving objectives at relevant functions and levels of the organization
- c) the means and time-frame by which the objectives are to be achieved

The program shall be reviewed at regular and planned intervals and adjusted to ensure that the objectives are achieved.

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## IMPLEMENTATION AND OPERATION

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### DEFINITION OF SAFE BEHAVIORS

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The organization shall ensure that all risks and accidents are taken into account when establishing, implementing and maintaining its B-BS Process.

The organization shall have in place, documented and updated behavioral checklists for the on-site observation of safety actions and conditions.

Behavioral checklist shall be customized and refreshed for the organization activities and plants: behaviors included in the checklists shall prevent specific risks and accidents of the organizations.

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### RESOURCES, ROLES, RESPONSIBILITY, ACCOUNTABILITY AND AUTHORITY

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Management shall demonstrate its active commitment to B-BS process by:

- a) evaluating data on both behavior change and safety outcomes to gauge the effectiveness of the BBS process
- b) ensuring the availability of resources essential to establish, implement, maintain and improve the B-BS process - resources includes human resources and specialized skills, organizational infrastructures, technology and financial resources;
- c) defining, documenting, communicating roles, responsibilities, accountabilities and delegating authorities to facilitate effective B-BS management.

Safety Leaders shall demonstrate its active commitment to B-BS process by

- a) assembling and analyzing behavioral observation data and reporting results to managers
- b) making personal observations according to the defined plan and assuring quality and reliability of the observations made by observers;
- c) organizing and conducting safety meeting with his/her direct reports;
- d) solving or addressing proposals to management for a necessary improvement of safety conditions elicited from the behavioral observations;
- e) reinforcing and motivating his/her direct reports for their safe behaviors, observation activities, suggestions for the safety facility improvement and all other behaviors that support safety values.

Observers shall demonstrate its active commitment to B-BS process by

- a) making personal observations according to the defined plan;
- b) assuring quality and reliability of the observations.
- c) actively participating to safety meetings and training sessions

Workers

- a) maintain safe behaviors, above all those included in behavioral checklist;
- b) actively participating to safety meetings and training sessions.

## COMPETENCE, TRAINING AND AWARENESS

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The organization shall identify training needs associated with B-BS Process implementation. It shall provide training and take other actions to meet these needs, evaluate the effectiveness of the training or action taken and retain associated records (i.e. training for Observers and for Safety Leaders).

## PARTICIPATION

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The organization shall establish, implement and maintain a procedure for the participation of:

- a) workers by their appropriate involvement in
  - the identification of task-related risks and respective safe behaviors to be included in the behavioral checklists;
  - the observation process;
  - investigation on causes of at-risk behaviors, at-risk conditions, accidents, first aids, near misses;
  - any changes that affect safety of working environment or B-BS process.
- b) contractors whenever the B-BS process involves them

## DOCUMENTATION

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The documentation of B-BS Process shall include

- a) the B-BS policy and general objectives (e.g. Mission & Values)
- b) behavioral checklists for the on-site observation of safety actions and conditions, consistent with internal safety procedures;
- c) graphic or tabular depictions of behavioral observation data and outcome data (rates of near-misses, first aid cases, lost time cases, fatalities)
- d) rules of the B-BS Process (e.g. features of observation process, of the workers meeting reviews, reward and celebration plan, discipline policy, etc.)

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## CHECKING

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### MEASURING AND MONITORING PERFORMANCES

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The organization shall establish, implement and maintain a procedure to monitor and measure of the B-BS effectiveness and efficiency on a regular basis. This procedure shall provide and document

- a) quantitative measures of safe/at-risk behaviors and safe/at-risk conditions;
- b) organization safety *indices*, goals based on results (e.g. reduction of safety indicators as frequency of lost time injuries index, frequency of first aids index, severity, near miss), and other *indices* for specific kind of activity (e.g. in transportation the rate of accidents per 100,000 miles driven);
- c) monitoring the implementation of the B-BS activities at each level of the organization (e.g. number of observation, number of safety meetings, etc.);  
list of undertaken actions facing at-risk conditions and barriers to safe behaviors reported in behavioral observations and in analysis of accidents, job-related illnesses, near misses, first aids;

After one year from the start of the B-BS process, the Organizations must show safe behaviors and outcomes improvements, compared to a baseline. Those improvements must be sustained or increased in the following years in order to be reasonably assured that the behaviors and outcomes have been influenced by the B-BS process.

The methods for calculating effectiveness first involve estimating, for each of the organizations safety-related measures, the level of the data before the B-BS process was begun.

Pre-Process Data to Post-Process Data shall be compared with the appropriate statistical instruments, according to the contest. For instance, in a static environment as a manufacturing plant, comparing safety Pre-Post indices of the same plant would be acceptable. On the other hand, in a dynamic contest, as a construction site, safety post-process indices could be benchmarked with the related industrial field<sup>3</sup>. In any case, the Organizations may support the demonstration of their B-BS process effectiveness by a reliable measurement of pre-post process frequency of behaviors, which evidences the enhancement of safe ones and a reduction of the at-risk ones.

If computerized equipment is required to store B-BS process data, the organization shall establish and maintain this equipment.

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### FEEDBACKS AND REINFORCERS

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The organization shall establish, implement and maintain a feedback procedure for communicating data and comments reported in behavioral observations, accidents analysis, and safety indexes trends.

The organization shall address feedbacks to workers, leadership and management members.

The organization shall provide reinforcers and/or celebrations to employees for their behaviors supporting the safety and the B-BS process (e.g. safe behaviors on the job, improvement of safe behavior indexes, number and quality of observations, number and quality of safety meeting; number of removed barriers to safe behaviors, increased frequency of behaviors, etc.)

The criteria for achieving rewards and celebration shall be public and well known by employees.

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<sup>3</sup> Look at dedicated areas on the website of AARBA ([www.aarba.eu/b-bs/certification](http://www.aarba.eu/b-bs/certification)) and of CCBS ([www.behavior.org](http://www.behavior.org)).

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## LIMITS OF PUNISHMENT

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Behavioral observations are best used to train employees and maintain safety practices. They are not to be used in disciplinary actions. The employees' observations with behavioral checklist shall not produce any sanction for the observed workers.

The organization shall never formally punish those at risk behaviors included in the behavioral checklists, neither out of the observation B-BS process.

The organization can define a limited number of high-risk behaviors eligible for formal punishments. Those high-risk behaviors shall not be included in the behavioral checklists.

The organization shall consistently apply this discipline policy.

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## ACCIDENT INVESTIGATION, CORRECTIVE AND PREVENTIVE ACTIONS

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The organization shall establish, implement and maintain a procedure to record, investigate and analyze accidents in order to:

- a) determine underlying behavioral or structural deficiencies;
- b) identify corrective and preventive actions needed (i.e. improvement of procedures and behavioral checklists; changes in the work conditions, tools and machineries);
- c) following up and tracking the implementation of corrective and preventive actions needed;
- d) communicate to workers the results of such investigations.

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## INTERNAL REVIEWS

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The organization shall ensure that internal reviews of the B-BS Process are conducted at planned intervals to:

- a) determine whether the B-BS Process in place
  - conforms to the designed B-BS Process;
  - is effective in meeting the organization's objectives on improving safe behaviors and results
- b) provides information about the reviews to management

Auditing activities shall be made by competent people expert in behavior analysis and with certified experience in B-BS. Auditors shall ensure objectivity and the impartiality of the audit process.

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## MANAGEMENT REVIEW

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Top management shall review the organization's B-BS Process at planned intervals to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and need for changes to the B-BS process, if necessary.

Input to management reviews shall include:

- a) results of internal reviews and evaluations of compliance with B-BS requirements;
- b) the results of participation to the process of different levels of the organization and consultation effectiveness;
- c) the safety performance, based on indexes, as the results from B-BS process implementation;
  - a. Behavioral observation data (e.g., profile of observed at-risk behavior and safety behavior)
  - b. Incidence rates using standardized metrics depicting accidents, injuries, illnesses, and fatalities.
- d) the status of accidents investigation, main corrective and preventive actions;
- e) follow up of actions decided during previous management reviews;
- f) recommendation for improvement.

The outputs from management reviews shall be consistent with the organization's commitment to continuous improvement and shall include any decisions related to possible changes to:

- a) B-BS performance;
- b) B-BS policy and objectives;
- c) Resources.

Management review shall be available for communication and consultation.