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IMPLEMENTATION ON BEHAVIOUR BASED SAFETY IN WAREHOUSE

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ABSTRACT

Requirement of law and execution of various strategies and practices by association to diminish mishaps at working environment is a continuum which has brought about new ways. The outcome showed that a sufficient improvement in wellbeing execution is conceivable with this methodology like Dock safety, stack safety, Manual material handling, rack safety, PIT and trolley handling, Rigging storage cage and Corona virus rules. Behaviour Based Safety (BBS) study is a cycle that makes a wellbeing organization among the executives and workers that persistently zeros in individuals' considerations and activities on theirs, and others, day by day security practices.

Keywords: Safety, Warehouse, storage and Potential hazard.

1. INTRODUCTION

1.1 BEHAVIOUR BASED SAFETY

Behaviour based safety (BBS) is a process that helps you and your co-workers identify and choose a safe behaviour over an unsafe one.

For BBS to work, all levels of company workers and management must work together.

BBS looks at how three things interact to improve safety

- Person
- Work Environment
- Behaviour

A behaviour-based safety approach promotes interventions that are people-focused and often incorporate one-to-one or group observations of employees performing routine work tasks, setting goals carefully and giving timely feedback on safety-related behaviour, coaching and mentoring. The initiatives have a proactive focus, encouraging individuals and their work groups to consider the potential for incident involvement, (accidents) and to assess their own behaviour as safe or unsafe always, no matter what.

1.1 BBS HISTORY

The methods employed in BBS originate from techniques used by psychologist and have only been used in occupational safety applications for approximately 30-years

Al-Hemoud et al (2006) Psychologists have identified a comprehensive behaviour change program as one that includes the following,

Identification of target behaviours.

Establishment of criteria in order to determine what consequences will apply to those behaviours that have to be changed.

Include the target audience as active participants in the process of implementing the program.

Provide training to all participants that the program will affect.

- Collect data in order to track progress.
- Provide feedback based on the data.
- Allow for adjustments to the program when necessary.
- Exercise a continued commitment to the program.

1.2 BEHAVIOUR VERSUS ATTITUDE

Your attitude and behaviour (actions) create the proper atmosphere for safety. It is vital that you and every worker be involved in creating a safety atmosphere. Supervisors and managers must lead by example. ABC Model One way to look at how changing your behaviour can improve safety is the ABC Model

- A = Activator – triggers behaviour
- B = Behaviour – what we do
- C = Consequence – reinforcement or punishment

Your attitude (the activator) affects how you behave.

Your behaviour has consequences – Consequences can either reinforce or deter a behaviour.

Positive reinforcement enforces safe behaviour.

Negative reinforcement deters unsafe behaviour.

BBS training attempts to reduce work-related injuries by creating a culture of safe behaviour through

1.3 SIX STEPS TO OBSERVATION PROCESS

Observe - Observe the job to make sure you understand what the worker is doing and provide necessary feedback.

Understand - Communicate effectively; make sure the workers understand why their behaviour is unsafe

Identify alternate behaviors - Coach the worker in the correct, safe behaviour and allow change for safer way of getting the job done.

Clarify commitment - Make it clear that workers are committed to doing the job safely through feedback and positive intervention.

Obtain agreement - Workers must agree to change unsafe behaviour to an alternate safe behaviour

Observe to follow-up - Observe workers at a later date to make sure they are using the safe behaviour; reinforce the safe behaviour with positive feedback.

2. LITERATURE REVIEW

Aswin Skaria Aliyachen et al (2018) is studied on implementation of behaviour-based safety (BBS) approached for managing occupational risks and prevention of workplace injuries in cement industry. In this paper presents implementation of behaviour-based safety (BBS) approached for managing occupational risks and prevention of workplace injuries in cement industry. The study evaluates and reports the efficiency of implementation of behaviour-based safety in cement industry. The efficiency of BBS is computed by comparing accident records before and after implementation of BBS. The result of the study shows that BBS can help in minimizing the accidents in workplace, specially the ones that occur because of human errors and negligence. This BBS technique was used to achieve higher standard of safety along with recommendation for control measures via various safety indicators, which are statistically valid, have ownership, trust, and unity among the team. BBS also develops empowerment and confidence toward employee safety at workplace. safety programs take time from manager to workers, accidents take time to investigate, but implementation of BBS doesn't require any cost, on the other hand, it builds trust, increases employability.

Marek Szczuka et al (2015) is studied on A behaviour-based approach to industrial safety management has been advocated by many authors and has been found to effectively improve safety performance. The costs associated with workplace injuries and the time required for accident investigation, provide companies with the incentive to identify ways to reduce these injuries. Behaviour Based Safety (BBS) is a term used to describe the prevention of accidents, injuries and loss in the workplace. BBS safety involves the practical application of safety procedures based on the real world behaviours of employees in work situations. Everyone is considered responsible not only for their own safety, but for the safety of others. Unsafe behaviour can trigger accidents and injuries. In this Industry Behaviour-based safety training and implementation helps improve organizational safety culture by increasing the quality and frequency of safety feedback in the organization, barriers between employees both within and across organizational levels are reduced. Improving safety communication (both correcting and rewarding feedback) through BBS leads to a more open, positive, and trusting safety culture as well as improved safety performance. BBS is a process that provides organizations the opportunity to move to a higher level of safety excellence by promoting proactive

responding to leading indicators that are statistically valid, building ownership, trust, and unity a cross the team, and developing empowerment opportunities which relate to employee safety.

Alok Pathak et al (2019) is studied on Industries Behaviour Based Safety (BBS) is very important to prevent accident and control workplace risk. Construction or Engineering industries is hazardous prone industries. Behaviour Based Safety (BBS) is an approach that creates a safety partnership between management and employees that continually focuses people's attentions and actions on daily Safety Behaviour that help to prevent work-related injuries and illnesses. Behaviour based safety help to create awareness among employees and employees understand their responsibility respect to safety and they protect self or their sub-ordinates from exposure of Potential hazard. Negative behaviour always create Poor attitude among employees and which lead to cause of Accident. Positive behaviour create good/positive attitude among employees and employees follow safety rules and procedures through its own desire and always involve to control work place risk. Behaviour based Safety (BBS) approach always helps to control work place. Behaviour-based safety helps to change the behaviour of employees from "at risk" behaviour's to "safe" behaviour's. Behaviour-based safety creates good safety culture at workplace and each individual hold safety as a 'value on priority and take responsibility for the safety of their co-workers also. In BBS Employees always eager and work to adopt safe practices and understand safety is prime responsibility of each individual. Strong management commitment, enforcement of rules and procedures, Reward to employees, trusting them and making communication between mgt. and employees regularly in regional language are few major parameters that help to create safety culture at workplace and develop.

Faridah Ismail et al (2012) is studied on Behavioural Based Safety (BBS) approach, the steps involved and the problems encountered. A case study approach comprising of the Oil and Gas companies practicing BBS had been chosen. The implementation of the Acts and the awareness to protect the workers has encouraged safety practitioners to develop methods or approaches to reduce the number of accidents. Behaviour based safety (BBS) is one of the approach to improve safety performance and decrease the number of accident cases at the workplace. The positive results in quality and safety environment were shown when implemented in the oil and gas industry. This Injuries and accidents at workplace contribute to loss of time of production, machineries damage and absence of the injured workers. The concept of Behaviour Based Safety (BBS) approach was revealed as to change unsafe behaviour to safe behaviour approach and to eliminate the occurring of accident in the work place. The basic steps of BBS implementation can be divided into 4 major steps; identify, observation, intervene, review and monitoring in oil and gas industry. The problems encountered has been identified as less involvement of management, staff and workers, workers worried on blaming and penalties during BBS observation, and lack of commitment.

Angela Lebbon et al (2012) is studied on Workers in food service industries regularly engage in behaviour that can put them at risk for injuries and routinely come into contact with hazardous conditions through their day-to-day tasks. Injuries in the food service industries may result from a single instance of contact with sharp objects, machinery, slippery floor surfaces, and hot surface. Lifting heavy pots and kettles, and working near hot ovens and grills are common causes of injuries, and common injury types include cuts, burns, and slips and falls. The injuries suffered by workers in food service industries can also occur through repeated at-risk behaviours, such as lifting heavy objects and working in static positions for long periods of time. For example, work-related musculoskeletal disorders can result from repetitive motion, poor posture at workstations. Employees were trained to identify safe and unsafe behaviour, conduct peer observations, and provide peer feedback. Data collected from observations were utilized to deliver graphic feedback. Managers were encouraged to review graphic feedback with employees weekly, provide prompts for observation, and praise employees for conducting observations. A committee composed of employees and managers met monthly to address safety concerns. Reductions in incidents were observed over the course of the behavioural safety intervention, but a reversal to base line could not be implemented. A negative correlation was observed between number of peer observations and number of recordable incidents. Results suggest that when employees conduct peer observations more frequently, the number of recordable incidents decreases.

3. PROBLEMS IDENTIFICATION

3.1 DOCK SAFETY

Truck/Vehicle keys not shall be seized from the driver by the security personnel as the truck halts for operation at the dock. The key not shall be placed at key management board under control of security at all times. Security shall avoid storage of key in other locations. The security personal not handover the wheel chokes to driver to be kept at a proper place to avoid any struck by hazard. During vehicle loading and unloading, there are chances of unexpected movement of vehicle. Unexpected movement of trucks while parked can be result in injuries.

Body trapped when truck moves on dock
 Fall of persons
 Vehicle run or hit by another vehicle

3.2 MANUAL MATERIAL HANDLING

Manual handling means transporting a load by one or more members which includes lifting, lowering, pushing, pulling, carrying and moving. All electrical cords, ropes, hoses, etc., shall be does not placed safely and securely to avoid hazards such as tripping or damage from oil, grease, water, or moving equipment. The load is carrying more than 20kg for employee's result is Back injuries are the most common & severe, contusion, back pain etc., Long objects (e.g., pipe or lumber) shall be carried on the same shoulder and the members should walk in step. Hazards associated with Manual Material Handling

Finger Crush or other limbs
 Cuts and bruises
 Sprained backs
 Contusion
 Fracture muscle strains
 Back injuries are the most common & severe, etc.

3.3 POWERED INDUSTRIAL TRUCKS (PIT) AND TROLLEY HANDLING

3.3.1 POWERED INDUSTRIAL TRUCKS

No employee shall be allowed to stand or move under raised forks
 No employee shall stand or lifted on raised forks.
 Operator shall not drive with raised forks.
 Never use complimentary weight.
 Never exceed the load limit.
 Never put your head between mast.
 Never keep your hands and legs outside the cockpit.

3.3.2 TROLLEY HANDLING

Moving two trolleys at the same time results is injury.
 Over height bags and shipment box uneven placed in trolley which may be collapse occur.
 Sometimes moving a trolley rash driving which may be effect in another person.
 Some of the employees moving trolley support handle.
 Using damaged trolleys.
 The trolley will be sometimes may be collapse due to uneven ground surface.

3.3.3 RIGGING STORAGE CAGE

Don't use damaged slings.
 Inside the cage not properly arranged the shipments it may collapse the cage result is any hazard.
 Don't drag the cage one member its heavy weight result is ergonomics.
 Some of them misusing the cage like rash moving.

3.4 STACK SAFETY

Don't stack incompatible materials together.
 Employees stacking more than 6ft result is collapse.
 Don't stack materials or load and unload materials near running machinery or near live electrical cable.

Don't block escape route, emergency equipment and pathways by stacking material can't use faulty mechanical tools or machines for stacking the material.

If stacked incorrectly, products, raw materials and other supplies can fall and cause injuries like cuts and bruises or even more serious injuries related to crushing.

One of the most common accidents related to storage is a stack collapsing. When materials are stacked too high or in an unstable arrangement, removing an item from the stack or bumping the stack can cause the rest of the materials to fall down. If heavy objects are involved, this can pose a real threat to employees.

3.5 RACK SAFETY

In our site having many stations. In each station 20 racks were scanning purpose employees were stating five to six members during covid 19 times.

Sometimes may be collapse the entire rack due to heavy load.

The employees were hitting the rack by trolley due to improper and rash driving.

Hazards associated with racking.

Fall of material from height

Materials collapse while stacking material at racks.

Collapse of structure (racks).

Hit by vehicle like trolley, cage and cart (near rack).

Deformation of racks due to overloading, leading to collapse.

Protruding material (such as bolts, splints from pallets etc).

4. IMPLEMENTATION & SOLUTIONS

4.1 DOCK SAFETY

Vehicle clearance - The vehicle shall initially get clearance from Inventory Receipt Note team (IRN), to enter the premises. Further clearance from concern department (i.e. Inbound, Outbound, etc) is required to authorize the truck to park either in parking space or at a dock.

Vehicle parking at a Dock - While parking the vehicle at a dock, it is to be ensured that the vehicle is properly parked

Key Seizure for operation- Truck/Vehicle keys shall be seized from the driver by the security personnel as the truck halts for operation at the dock. The key shall be placed at key management board under control of security at all times.

Placing the wheel chocks - The security personnel shall handover the wheel chocks placed at docks (to be kept at a proper place to avoid any 'struck by' hazard) to the driver and guide the driver to place the chocks in front of two wheels (in diagonal, example left front and right back wheels), to avoid movement of vehicle during operations. The wheel chocks should be place in the center of Tyre.

4.1.1 PROPER LIGHTING/DOCK LIGHTS

As trailers/long trucks usually don't have interior lights, they are dark and hazardous. Provision of loading lights at each dock position should be done to improve visibility and reduce injury hazards. Also, ensure proper measures are taken to avoid glare at docks.

Removal of wheel chocks and return to security staff:

Once the operations are finished, and truck is ready to move. Wheel chocks shall be received from the driver by security personnel.

The respective key of the vehicle shall be given back to the driver to leave the dock area.

Safe exit of vehicle from the dock/premises:

Dock marshal and or supervisor to ensure closure of vehicle container door, before allowing movement of the vehicle. It avoids possibility of collision with pass by vehicles/person.

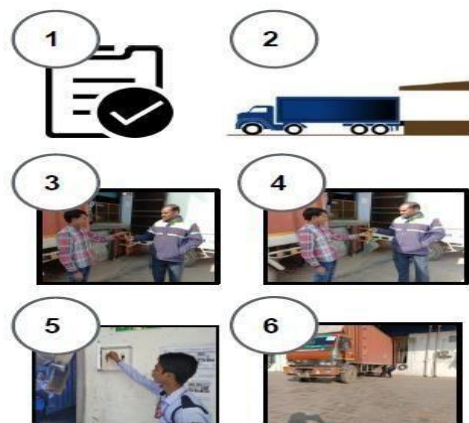


Figure: 1 Dock Safety Procedure

4.2 MANUAL MATERIAL HANDLING

Safe Working Practices.

Determine the weight of the object.

Consider the distance to be transported.

Look over the area for tripping hazards, slippery spots, sharp corners, blind spots, uneven edges etc.

Check for loose objects on elevated area, which may fall on member while lifting the load.

All electrical cords, ropes, hoses, etc., shall be placed safely and securely to avoid hazards such as tripping or damage from oil, grease, water, or moving equipment.

Check for adequate lighting on all work areas, stairways, etc.

Watch for narrow places when moving materials.



Figure 2 Important of behaviour based safety



Figure 3 Training at manual material handling TEAM LIFTING

When the load is more than 20 kg, additional manpower is required.

Two or more members transporting a large load should adjust the load so that each member carries equal weight.

Long objects (e.g., pipe or lumber) shall be carried on the same shoulder and the members should walk in step.

Ensure one member has to give command and next member to follow his command.

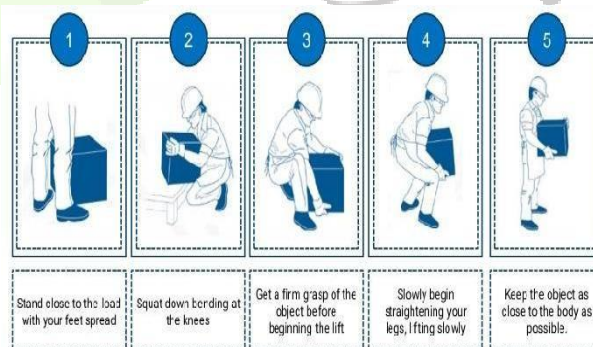


Figure 4 Lifting Techniques

4.3 POWERED INDUSTRIAL TRUCKS (PIT) AND TROLLEY HANDLING

4.3.1 Powered Industrial Trucks (PIT)

Use Safe Speeds.

Avoid abrupt stops.

Emergency button shall be in operating condition.

Don't entertain, encourage for pick up other.

Be aware of fork position.

Keep the load level stationary when in motion do not overload.

Keep alert for floor conditions.

Watch out for blind spots.

Slow down and sound horn at corners.

Wear hard hats, reflective jackets and safety.

4.3.2 Trolley handling

Never intentionally create large loads when a variety of small loads are a safer alternative.

Ensure the employee is capable of moving the trolley.

Check the condition of the trolley before using it.

Is the platform trolley designed for the task in hand & can the load be moved safely without risk of private injury or damage to the load or property.

Always wear suitable loose-fitting clothing, safety footwear, and gear. Make use of private protective equipment where appropriate.

Make sure the operator can safely load and unload the trolley (anything over 25 kg they'll need assistance – counting on the operator).



Figure 5 Consequences of at risk behaviour



Figure 6 Training in trolley handling

4.3.3 TECHNIQUES FOR SAFE HANDLING OF A PLATFORM TROLLEY

When it comes to handling platform trolley, there are various aspects the operator must consider to ensure safe use, these include:

Beware of slope - There's a possible risk of the platform trolley tipping over a slope. Make sure that the load is evenly distributed and you've got a firm grip on the trolley. Beware that the trolley may tip if the slope is just too steep and therefore the load is too heavy.

Applying force - The force needed to loaded trolley is roughly 2-3 percentage of the entire weight. This may also depend upon other factors like the surface, type of wheels and therefore the strength of the operator. You'll be able to apply more force by leaning your body weight into the load to make the work easier.

Uneven surface - You're likely to come across difficult and uneven surfaces when pushing your platform trolley. Softer grounds, like sand or mud, will likely need more force. Confirm you're using the right wheel for the surface to avoid the accident.

Loading the platform trolley - Load only items onto the platform trolley that you can do without any injury. If the item is just too heavy, ask for assistance from another person.

Unloading the platform trolley - When you are unloading the platform trolley, carefully drop the load onto the platform.

4.4 RIGGING STORAGE CAGE

Make sure the staff involved are well trained and experienced.

Use only certified tools, hoists, equipment and inspect them before each use.

Determine the weight of the load to be lifted.

Determine the center of gravity of the load to be lifted and attach the sling.

Make sure the center of gravity is directly below the lifting hook.

Determine the appropriate lifting hooks, plates, shackles or hitch for the type of load.

Check the safety latch in all hooks.

Check the swing area, barricade it, and warn people nearby.

Determine the safe hooking angle (lower the angle between sling and load, increase sling tension) and sling tension.

Determine the correct sling based on the load.

Ensure good communication between the rigger and the operator.

Perform maintenance work only at specified locations.

Always use appropriate PPE (Personal Protective Equipment).

4.5 STACK SAFETY

Boxes kept at the bottom of the pallet shall be free from damages and stable to avoid collapse.

Employees involved in the storage, stacking, loading and unloading of materials must be trained to carry out their tasks safely and efficiently.

When stacking bags or bundles of material, alternate rows. For example, place one row running lengthwise, the next running width wise, the third lengthwise, etc. for the material of same size and different size.

The height pallet building shall be of 6ft.

While stacking the material should be same order.

Special care must be taken in handling and transporting flammable liquids. These should not be stored at an unsafe height.

Stack loads evenly and straight.

Place heavier loads on lower-to-middle shelving.

Do not stack items high enough to block sprinklers or come in contact with overhead lights or pipes.

Make sure staff follow the safe stacking height and weight capacity recommended by the manufacturer.

They should stack them evenly, with heavier pallets on the bottom.

Employers need to make sure warehouse workers follow a set of standards for the storage of materials to avoid these accidents. In this post we will examine various types of hazards related to stacking and storing and how to prevent accidents, as well as tips for labelling storage areas in warehouses.

4.6 RACK SAFETY

Periodically inspect all components of the racks system of damage and any delay.

All racks shall be properly guarded, and adequate distance shall be maintained between guards and aisles (for avoiding collision / impact of material handling equipment / employee with the guards).

All bracings shall be tightened properly and inspected periodically for its condition.

Damaged racks shall be clearly identified and communicated to avoid stacking material on those racks.

Heavy loads shall be planned to stack at the lower levels at racks and light loads to be stacked at the top of the racks.

At any point of time, racks shall not be overloaded above its specified limit as mentioned by the manufacturer.

In case of, alteration to any part of the rack, load assessment to be carried out before stacking at the other section of the racks.

Employees shall be trained, communication on handling material at racks and specified safe working load of the racks.

Don't climb on the racks.

Awareness to be provided for employees on rack safety and material handling associated with racks.

5. CONCLUSIONS

The concept and process of BBS can bring for safety professionals and everyone who are concerned about correcting unsafe behaviours for reduction of accidents and promoting safe behaviours for developing injury free culture in their organizations. Behaviour-based safety training and implementation helps improve organizational safety culture. By increasing the quality and frequency of safety feedback in the organization, barriers between employees both within and across organizational levels are reduced. Improving safety communication (both correcting and rewarding feedback) through BBS leads to a more open, positive, and trusting safety culture as well as improved safety performance. BBS is a process that provides organizations the opportunity to move to a higher level of safety excellence by promoting proactive responding to leading indicators that are statistically valid, building ownership, trust, and unity a cross the team, and developing empowerment opportunities which relate to employee safety. BBS technique was used to achieve higher standard of safety along with recommendation for control measures via various safety indicators, which are statistically valid, have ownership, trust, and unity among the team. Provide in-plant, practical training for the BBS observers and steering committee members on how to perform tasks such as setting up the observation process, developing metrics, making accuracy and consistency checks, and determining the steering committee's function. Implementation of a behaviour based safety intervention is a major exercise and it involves the application of important change principles. The key features of the BBS implementation are the commitment, focus, purpose and execution.

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