# LIFE SAVING BEHAVIOUR IN MANUFACTURING INDUSTRY

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***Abstract***

Human behaviour is a major contributor of Manufacturing Industry revealed by many occupational safeties literatures. The presence of good safety behaviour does reflect good safety compliance as well as Life Saves. Safety issue cannot be tackle effectively without interference of employers with a particular pattern of behaviours as important criteria needed to change employee's behaviours. Thus, the primary objective of this study is to identify employers' behavioural safety compliance factors contribute to encourage employees' towards behavioural safety compliance. This paper is an initial study with the hope that the finding will leads the establishment of safety indicators for behavioural safety compliance in the construction industry. Life Saving Behaviour (LSB) is the application of science of behavior change to real world safety problem. "A process that creates a safety partnership between management and employees that continually focuses people's attentions and actions on theirs, and others, daily safety behavior. "BBS "focuses on what people do, analyzes why they do it, and then applies a research-supported intervention strategy to improve what people do".At its very core BBS is based on a larger scientific field called organizational behavior management.

In a safety management system based upon the hierarchy of hazard control, LSB may be applied to internalize hazard avoidance strategies or administrative controls (including use of personal protective equipment), but should not be used in preference to the implementation of reasonably practicable safety measures further up the hierarchy.

**Keywords : LSB ,application, hazard control , preference and implementation**

## 1.INTRODUCTION

Traditional approaches on the prevention of accidents/injuries in mines reached its limit of effectiveness in improving safety performance and a fresh approach is utmost required. Behavioral safety analysis has been identified as an effective alternative in many industries[1]. This paper is therefore sought to examine the role of behavioral factors on the occurrence of mine accidents and injuries through a case study[2]. Data were collected from two neighboring underground coalmines operating under a large public sector organization of India. High–low plots and t-test were done to explore the differences between behavioral characteristics of accident involved (case) and non-involved (control) workers.

How these differences could cause accidents/injuries in mines was estimated through structural equation modeling[3]. The case study results show that accident group of workers (cases) are more job dissatisfied, negatively affected, and highly risk taking compared to the non-accident group of workers (controls). The accident model path analysis shows that negative affectivity, job dissatisfaction, and risk taking behaviors predict an increased number of injuries in mines. Apart from direct influences to work injuries, negative affectivity and job dissatisfaction make workers to take more risks and behave unsafely[4]. These findings contribute to the design of safety programs including safety training, which should be behaviorally motivated. Mine safety management of the case study mines should outskirt their age old belief that accidents/injuries are due to hazardous nature of mining and only engineering control and regulatory monitoring are sufficient for improving safety of the mines.

**OBJECTIVES**

1. The objectives for this study are as follows
2. To study and analyze where the fatal accidents & incidents happens in the Manufacturing industry
3. To trace the causes of accident in the work place.
4. To assess the management commitment towards employees safety in the work place.
5. To suggest suitable measures for improving employees safety to save their life.
6. Thinking that observation and Participation are the core of life saving behavior by proper safety systems.
7. Not training managers, supervisors and hourly employees in the core principles of behavior change technology.
8. Shows Important of the Life of employees, those who involves in the risky work.

## 2.RESEARCH METHODOLOGY

**Research**

Research is a process in which the researcher wishes to find out the end result for a given problem and thus the solution helps in future course of action. The research has been defined as “A careful investigation or enquiry especially through search for new fact in any branch of knowledge”.

### 2.1 Research Methodology

The procedure using, which researchers go about their work of describing, explaining and predicting phenomena, is called Methodology. Methods compromise the procedures used for

generating, collecting, and evaluating data. Methods are the ways of obtaining information useful for assessing explanation.

**2.2 Types of Research**

The type of research used in this project is descriptive in nature. Descriptive research is essentially a fact finding related largely to the present, abstracting generations by cross sectional study of the current situation .The descriptive methods are extensively used in the physical and natural science, for instance when physics measures, biology classifies, zoology dissects and geology studies the rock. But its use in social science is more common, as in socio economic surveys and job and activity analysis.

**2.3 Design of descriptive studies:**

Descriptive studies aim at portraying accurately the characteristics of a particular group or solution. One may undertake a descriptive study about the work in the factory, health and welfare. A descriptive study may be concerned with the right to strike, capital punishment, prohibition etc.

A descriptive study involves the following steps:

1. Formulating the objectives of the study.
2. Defining the population and selecting the sample.
3. Designing the method of data collection.
4. Analysis of the data.
5. Conclusion and recommendation for further improvement in the practices.

## 3.EXPERIMENTATION

**ACCIDENT ANALYSIS**

**Fatal Work Injuries in Ohio — 2018**

Fatal work injuries totalled 164 in 2018 for Ohio, the U.S. Bureau of Labor Statistics reported today. Assistant Commissioner for Regional Operations Charlene Peiffer noted that the number of work-related fatalities in Ohio was down from 202 in the previous year. Fatal occupational injuries in the state have ranged from a high of 222 in 1999 to a low of 137 in 2011. (See fig 1.) Nationwide, a total of 5,190 fatal work injuries were recorded in 2016, a 7-percent increase from the 4,836 fatal injuries in 2017, according to the results from the Census of Fatal Occupational Injuries (CFOI) program. This was the third consecutive increase in annual workplace fatalities and the first time more than 5,000 fatalities have been recorded since 2010.

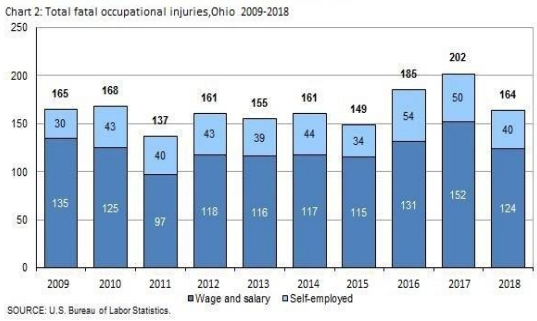



**Fig 1** **Fig 2**

### 3.1 Type of incident

In Ohio, transportation incidents resulted in 54 fatal work injuries. Violence and other injuries by persons or animals accounted for 31 fatalities. These two major categories accounted for 52 percent of all workplace fatalities in the state. (See table 1.) Over the year, the number of worker deaths from transportation incidents decreased from 92, while fatalities due to violence and other injuries by persons or animals were up from 27.

Falls, slips, or trips was the third-most frequent fatal work event with 29 fatalities, unchanged from the prior year. Exposure to harmful substances or environments resulted in 25 work-related deaths compared to 23 in 2017.

Nationally, transportation incidents were the most frequent fatal workplace event in 2018, accounting for 40 percent of fatal work injuries. (See fig 2.)

### 3.2 Technical Note

Background of the program.The Census of Fatal Occupational Injuries (CFOI), part of the BLSOccupational Safety and Health Statistics (OSHS) program, compiles a count of all fatal work injuries occurring in the U.S. during the calendar year. The CFOI program uses diverse state, federal, and independent data sources to identify, verify, and describe fatal work injuries. This ensures counts are as complete and accurate as possible. For the 2018 national data, over 23,300 unique source documents were reviewed as part of the data collection process. For technical information and definitions for CFOI, please go to the BLS Handbook of Methods on the BLS

Federal/State agency coverage.The CFOI includes data for all fatal work injuries, even those that may beoutside the scope of other agencies or regulatory coverage. Thus, any comparison between the BLS fatality census counts and those released by other agencies should take into account the different coverage requirements and definitions being used by each agency. Acknowledgments.BLS thanks the Ohio BWC Division of Safety and Hygiene for their efforts incollecting accurate, comprehensive, and useful data on fatal work injuries. BLS also appreciates the efforts of all federal, state, local, and private sector entities that provided source documents used to identify fatal work injuries.

## 3.3 FATAL WORK INJURIES

**Table 4.1. Fatal occupational injuries by event or exposure, Ohio, 2017–18**

| **Event or exposure** | 2017 | | 2018 |
|---|---|---|---|
| **Description** | Number | Number | Percent |
| **Total.** | 202 | 164 | 100 |
| Violence and other injuries by persons or animals | 27 | 31 | 19 |
| Intentional injury by person | 25 | 30 | 18 |
| Homicides (Intentional injury by other person) | 17 | 13 | 8 |
| Shooting by other person--intentional | 14 | 12 | 7 |
| Suicides (Self-inflicted injury--intentional) | 8 | 17 | 10 |
| Shooting--intentional self-harm | 4 | 6 | 4 |
| Hanging, strangulation, asphyxiation--intentional self-harm | 2 | 7 | 4 |
| Transportation incidents | 92 | 54 | 33 |
| Pedestrian vehicular incident | 14 | 11 | 7 |
| Roadway incidents involving motorized land vehicle | 55 | 31 | 19 |
| Roadway collision with other vehicle | 33 | 15 | 9 |
| Roadway collision--moving in same direction | 8 | 6 | 4 |
| Roadway collision with object other than vehicle | 18 | 12 | 7 |
| Vehicle struck object or animal on side of roadway | 18 | 11 | 7 |
| Nonroadway incident involving motorized land vehicles | 10 | 10 | 6 |
| Nonroadwaynoncollisionincident | 7 | 7 | 4 |
| Jack-knifed or overturned, nonroadway | 4 | 5 | 3 |
| Falls, slips, trips | 29 | 29 | 18 |
| Falls on same level | 5 | 6 | 4 |
| Falls to lower leve | 21 | 23 | 14 |
| Other fall to lower level | 17 | 17 | 10 |
| Exposure to harmful substances or environments | 23 | 25 | 15 |
| Exposure to other harmful substances | 15 | 17 | 10 |
| Nonmedical use of drugs or alcohol--unintentional overdose | 11 | 17 | 10 |
| Contact with objects and equipment | 29 | 24 | 15 |
| Struck by object or equipment | 23 | 16 | 10 |
| Struck by powered vehicle--nontransport | 11 | 10 | 6 |

**Table 3.2. Fatal occupational injuries by industry, Ohio, 2017–18**

| Industry | 2017 | | 2018 |
|---|---|---|---|
| **Description** | Number | Number | Percent |
| **Total** | 202 | 164 | 100 |
| Private industry | 191 | 155 | 95 |
| Natural resources and mining | 22 | 19 | 12 |
| Agriculture, forestry, fishing and hunting | 18 | 19 | 12 |
| Crop production | 13 | 11 | 7 |
| Animal production and aquaculture | 3 | 5 | 3 |
| Construction | 37 | 23 | 14 |
| Construction | 37 | 23 | 14 |
| Heavy and civil engineering construction | 11 | 5 | 3 |
| Specialty trade contractors | 21 | 14 | 9 |
| Building finishing contractors | -- | 5 | 3 |
| Manufacturing | 19 | 14 | 9 |
| Manufacturing | 19 | 14 | 9 |
| Trade, transportation, and utilities | 55 | 42 | 26 |
| Retail trade | 11 | 8 | 5 |
| Transportation and warehousing | 36 | 32 | 20 |
| Truck transportation | 25 | 26 | 16 |
| General freight trucking | 15 | 22 | 13 |
| General freight trucking, local | 1 | 6 | 4 |
| General freight trucking, long-distance | 12 | 16 | 10 |
| General freight trucking, long-distance, truckload | 5 | 13 | 8 |
| Professional and business services | 16 | 16 | 10 |
| Administrative and waste services | 14 | 13 | 8 |
| Administrative and support services | 11 | 9 | 5 |
| Services to buildings and dwellings | 7 | 7 | 4 |
| Landscaping services | 6 | 7 | 4 |
| Educational and health services | 9 | 9 | 5 |
| Health care and social assistance | 9 | 8 | 5 |
| Leisure and hospitality | 13 | 16 | 10 |
| Accommodation and food services | 9 | 12 | 7 |
| Food services and drinking places | 8 | 11 | 7 |
| Restaurants and other eating places | 6 | 9 | 5 |
| Restaurants and other eating places. | 6 | 9 | 5 |
| Limited-service restaurants | 5 | 7 | 4 |
| Other services, except public administration | 13 | 11 | 7 |
| Other services, except public administration | 13 | 11 | 7 |
| Repair and maintenance | 7 | 6 | 4 |
| Government | 11 | 9 | 5 |
| Local government | 7 | 7 | 4 |

**Table 3.3. Fatal occupational injuries by occupation, Ohio, 2017–18**

| **Occupation** | 2017 | 2018 | |
|---|---|---|---|
| **Description** | Number | Number | Percent |
| **Total.** | 202 | 164 | 100 |
| Management occupations | 22 | 16 | 10 |
| Other management occupations | 22 | 14 | 9 |
| Farmers, ranchers, and other agricultural managers | 13 | 12 | 7 |
| Farmers, ranchers, and other agricultural managers | 13 | 12 | 7 |
| Healthcare practitioners and technical occupations | 8 | 5 | 3 |
| Protective service occupations | 8 | 7 | 4 |
| Law enforcement workers | 2 | 5 | 3 |
| Police officers | 2 | 5 | 3 |
| Police and sheriff's patrol officers | 2 | 5 | 3 |
| Food preparation and serving related occupations | 2 | 5 | 3 |
| Building and grounds cleaning and maintenance occupations | 10 | 12 | 7 |
| Grounds maintenance workers | 4 | 9 | 5 |
| Grounds maintenance workers | 4 | 9 | 5 |
| Landscaping and grounds keeping workers | 2 | 5 | 3 |
| Sales and related occupations | 13 | 11 | 7 |
| Farming, fishing, and forestry occupations | 5 | 5 | 3 |
| Construction and extraction occupations | 33 | 21 | 13 |
| Construction trades workers | 26 | 18 | 11 |
| Installation, maintenance, and repair occupations | 12 | 11 | 7 |
| Vehicle and mobile equipment mechanics, installers, and repairers | 5 | 5 | 3 |
| Production occupations | 13 | 10 | 6 |
| Metal workers and plastic workers | 6 | 5 | 3 |
| Transportation and material moving occupations | 63 | 49 | 30 |
| Motor vehicle operators | 51 | 34 | 21 |
| Driver/sales workers and truck drivers | 47 | 33 | 20 |
| Driver/sales workers | 10 | 5 | 3 |
| Heavy and tractor-trailer truck drivers | 35 | 28 | 17 |
| Material moving workers | 10 | 12 | 7 |
| Laborers and material movers, hand | 7 | 6 | 4 |
| Laborers and freight, stock, and material movers, hand | 6 | 5 | 3 |

**Table 3.4. Fatal occupational injuries by selected demographic characteristics, Ohio, 2017–18**

| Worker characteristics | 2017 | 2018 | |
|---|---|---|---|
| **Deascripotion** | Number | Number | Percent |
| **Total** | 202 | 164 | 100 |
| **Employee status** | | | |
| Wage and salary workers (1) | 152 | 124 | 76 |
| Self-employed (2) | 50 | 40 | 24 |
| **Gender** | | | |
| Men | 180 | 150 | 91 |
| Women | 22 | 14 | 9 |
| Age (3) | | | |
| 20 to 24 years | 13 | 9 | 5 |
| 25 to 34 years | 27 | 32 | 20 |
| 35 to 44 years | 37 | 24 | 15 |
| 45 to 54 years | 57 | 34 | 21 |
| 55 to 64 years | 39 | 31 | 19 |
| 65 years and over | 27 | 31 | 19 |
| Race or ethnic origin (4) | | | |
| White, non-Hispanic | 170 | 138 | 84 |
| Black or African-American, non-Hispanic | 16 | 12 | 7 |
| Hispanic or Latino | 11 | 10 | 6 |

1. May include volunteers and workers receiving other types of compensation.
2. Includes self-employed workers, owners of unincorporated businesses and farms, paid and unpaid family workers, and may include some owners of incorporated businesses or members of partnerships.
3. Information may not be available for all age groups.

## 4.RESULTS AND DISCUSSION

The logic behind the practice of Life Saving Behaviour principles at the workplace is that these principles are the basic requirements for high efficiency in Safety. Avoid the activities which is unsafe & to be follow the procedure as what is defined. It is not only to achieve the score, eliminate the Incidents by control measures. Train the people & update their knowledge to develop & conduct oral examine.To implement other improvement

tools such as standardized work, Increase the awareness, avoid negligence, quality by perform a safe work, concentrated to follow the procedures, improve the system by apply and practise LSB at the work place, work stress to be eliminate in peak hours, work methodologies may not be compromise. Life Saving Behaviour is the part of Total Quality Management. Simultaneously while working the team members should inspect the equipment before starts the work confirm as it's also a crucial part of Total Quality Management. Simultaneously while inspect the equipment –listen and keep a watch for anomalies and take action before a incident occurs, we prevents from risk by analyze to stop in any condition.

**RESULTS OBTAINED IN SHOP FLOOR**

1. We don't checks the safety device in the Machine
2. In case of emergency, use the hand power machine without guard
3. Negligence of safety sound by over confidence
4. Couldn't be control the similar incidents in prevent
5. Risk may be justify instead of finding solution is too late
6. Scale measured value is difficult to find the cause

# 5.CONCLUSION & SCOPE OF FUTURE

## 5.1INTRODUCTION

This research work was focused on design and development of computational based safety methodology and improving Safety performance through focused on this. During the first stage of research work to found a fatal accidents happened in which area recorded more that was identified. After the development of 'Life Saving Behaviour, the implementation study was conducted at various divisions of Manufacturing Sector to conform its performance. Similarly, 'Construction' field also can apply the techniques to improve safety activities in their work place. This report consists of four implementation studies.
in the industry.The development procedures can help to develop a safety score as well as can increase the confident to work with a peace mind. It point However, due to the paucity of time and difficulty in undertaking extensive travelling, the data on the performance of Life Saving Behaviour could be gathered only at HAL, Bangalore. This chapter includes the conclusion of this research work and further work required in this research scenario.

## 5.2 PROGRESSION BY LIFE SAVING BEHAVIOUR

The implementation of these procedure companywide can yield marvellous results – preventing accidents, reducing down time, enhancing operational control of processes, and creating a healthier corporate climate. The previous safety principles are the basic requirements for increased efficiency in producing better quality products and services with little waste. The success of that is shown by its recognition in industries. These things created & developed by individuals in some particular work place, but not collaborated s out that Sustain is an integral part of industrial safety.

## 5.3 SOLUTION FOR RESEARCH PROBLEMS

At the commencement of this research work four questions were posed as the Research problem. During the course of this work solutions were obtained for all the questions **(Table 6.1).**

| Q.No. | Research Question | Obtained solution |
|---|---|---|
| 1. | What is the purpose of the Life Saving Behaviour in the field of the Manufacturing Industry? | The most common cases of Fatal Accidents happened in this particular area. |
| 2. | Why only focused this area to improve safety and make it as standardized? | If prevention action taken to eliminate the death rates & fatal injuries. |
| 3. | While spend a more money & time in some time, there may be a loss for the Management? | Human life is more valuable, It couldn't be tolerate by Money, So Save life. |
| 4. | What are the methods to be followed by improving Life Saving Behaviour? & How it to be Implement in the Shop floor? | To train & educate the knowledge for Shop floor Team Members as well as Management. By getting suggestions from them, will get a good result as continuous improvement. |

## 5.4 BENEFITS OF 'LIFE SAVING BEHAVIOUR' IN 'SHOP FLOOR'

The following positive effects were observed by the implementation of 'Life Saving Behaviour' in the manufacturing Industry.

1. Easy understanding of zone responsibilities with respect to area of improvement because of clear and multiple check points. 'Safety' awareness created among the personnel
2. Preventive action taken before failure
3. Awareness reach to the Team members by the assessment

4. Cases requiring ‘Not Applicable’ were totally eliminated because of area wise (Shop floor, Office and Stores) specific system is easy Continuous improvement is much possible in day today activities
5. Sustenance has improve
6. The following improvements were observed by the implementation of the ‘Life Saving Behaviour’ in the Manufacturing Industry:
7. Reduce work fatigue
8. Team Member skill develop
9. Eliminate Unsafe Equipment
10. Use the equipment in right way
11. Ensure the tools before they use
12. Escalate their problems to create a safe work zone

**5.5 BENEFITS OF LIFE SAVING BEHAVIOUR ACTIVITIES**

The following benefits were identified while implementing Life Saving Behaviour in the organization during the case study:

1. Improve the Safety standards
2. Create Safe Work Environment
3. The Quality of the Safety is good
4. Risk reduce in the part of work
5. High Efficiency Output

**5.6 SCOPE FOR FUTURE WORK**

Life Saving Behaviour is the long-time research, here Finding Results by the cases which I studied and recorded in this Thesis. That kind of longevity in the safety world is rare and typically indicates that a system is working. That would certainly seem to be the case with LBS. It is not a magic spell that will suddenly make all of a company’s safety woes disappear, nor is it designed to be. Criticisms of the system can be well founded if the system is not installed correctly and handled by knowledgeable, experienced practitioners. In LBS systems in which reinforcement is given in the form of rewards and prizes, a great deal of caution must be exercised. Incentive programs that focus on giving employees tangible items for being safe – usually translated as not having any injuries – can quickly drive down incident reporting and create a culture that encourages hiding injuries. In Future, It will be implemented by all the industries to save life of human beings as eliminate losses. That is a recipe for disaster from both regulatory and ethical standpoints.

The hard data that has been collected over the years provides evidence that LBS is effective at reducing injuries and the associated injury rates. The behavioral principles upon which it is founded are sound and time-tested. Large, well-respected companies continue to devote sizable resources to the development and maintenance of LBS systems. All of this collectively points to a successful, fruitful, dependable methodology that gets results.

**5.7 CONCLUSION**

The success Life Saving Behaviour implementation depends on personnel involvement and motivation, which in turn depends on proper communication and sharing of knowledge. However Standardization and Sustain activities focused on these factors followed by focused the gap is still an option in LSB improvement process.

Even though Safety has been considered as a part of an important term to protect from an accidents, no system is available for Life Saving Behaviour concentrated and is often a shaky subject since the ranking scores would depend on the expectations of the Management. A good communication methodology is required for improving the performance of Life Saving Behaviour activities. Moreover it is mandatory that the auditing system be customized. To minimize this subjectivity, this research work has led to the design of LSB Worksheets for Shop floor, Stores and Office and development.

Many service industries have already implemented This principles in their regular activities. This research work developed a group of activities for to find the solution which helps in promoting LSB activities in shop floor. The implementation results show that this focused system helps in reducing deviation in the ratings scores. By that can understand the awareness of team members.

This research work also resulted in development of improving the performance of LSB activities through proper communication and helped in showing large amount of information in a well-organized manner to management and people working in the organization.It may be concluded that Life Saving Behaviour helps in avoiding the ambiguity in the Safe work system thereby ensuring maximum efficiency and reliability, and that Job Pause report is one of the best tools for improving the LSB activities at a faster rate.

## 5.8 FUTURE SCOPE

Life Saving Behaviour is the long-time research, here Finding Results by the cases which I studied and recorded in this Phase. Further studies will continue to find the solution in

Thesis. That kind of longevity in the safety world is rare and typically indicates that a system is working. That would certainly seem to be the case with LBS. It is not a magic spell that will suddenly make all of a company's safety woes disappear, nor is it designed to be. Criticisms of the system can be well founded if the system is not installed correctly and handled by knowledgeable, experienced practitioners. In LBS systems in which reinforcement is given in the form of rewards and prizes, a great deal of caution must be exercised. Incentive programs that focus on giving employees tangible items for being safe – usually translated as not having any injuries – can quickly drive down incident reporting and create a culture that encourages hiding injuries. That is a recipe for disaster from both regulatory and ethical standpoints.

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