Methodology

The chapter on Methodology has been discussed under the following headings:
1. Selection of topic
2. Review of available literature on the topic
3. Pilot study
4. Hypothesis
5. Secondary data collection
6. Primary data collection
7. Analysis of primary data collected

Selection of Topic

Based on the working experience of the researcher in engineering companies as a safety professional, it was learnt that the major cause of industrial accidents are unsafe actions of the personnel. Hence, the present topic was selected to investigate into the causes of industrial accidents in various engineering companies and if possible to benchmark a solution for reducing such kinds of accidents. Discussions were held with experts in the field of industrial safety before finalizing the topic.

Review of available literature on the topic

Extensive appraisal of the available writings on the topic was done from books, journals, and websites available in India and abroad. These helped to gain an insight into the topic, which became the foundation for developing different questionnaires for the primary data collection. Four sets of questionnaires were developed which were administered to the Factory Manager, Safety Officer, Line Supervisor and the employee who met with the accident, respectively. These are attached as Appendices 1a, 1b, 1c and 1d respectively.
Pilot Study

To test the feasibility of the questionnaires developed, a pilot study was conducted. This was done on 3 cases of industrial accidents, in Cummins Sales & Service India Ltd. A personal interview was conducted together with the questionnaires with the worker who met with the accident, factory manager, line supervisors and safety officer concerned. A working hypothesis was developed based on the data collected. It was found that the questionnaires were feasible and could be administered to similar personnel in other factories also.

Hypothesis

From the pilot study conducted the following hypothesis was derived.

1. Unsafe behavior is the main reason for accidents.
2. More emphasis must be given on Behavior Correction Process.
3. Unsafe conditions at work must also be taken care of to prevent accidents.

Secondary data collection

For collection and study of secondary data (literature review), books and journals on Basic Psychology, Industrial Psychology, Safety Psychology, and Industrial Safety were referred. Beside this, websites, on Health & Safety which are run by Governments of many nations and by Safety councils were referred to, to collect the data. Full reference of the same is given in the chapter on Bibliography.

Primary Data Collection

For collecting the data on accidents and its causes, 5 mechanical engineering companies were selected in and around Pune region. The criterion for
selection of the company was that it should have more than 100 employees working for it. The companies selected were:

a. Mahindra Forging Ltd, Chakan, Pune.
b. Exide Batteries Ltd, Pimpri, Pune.
d. Virgo Engineers Ltd, Hinjewadi, Pune.
e. Cummins Sales & Service (I) Ltd, Erandawana, Pune.

Discussions were held with the concerned personnel about the aim of the study and what kind of data is required for the same. Only the accidents which were of high potential and had resulted into maydays lost were selected from the list of accidents. A total of 17 accident cases were selected for the study. A personal interview was held after developing rapport with the workers, line supervisors, safety officers and factory managers for getting the information about the accident with the help of the questionnaires.

Details of the accident were gathered from the accident reports collected from the Safety Officers concerned. A sample accident report is attached in Appendix 2.

The main questions covered in the questionnaire for management cadre (Factory Manager, Safety Officer and Line Supervisor) were:

a. Information about the accident.
b. Other details of the accident.
c. Interviewee’s comments on the accident investigation (focused on unsafe actions / conditions)
d. Rating on a scale of 1 to 10 was asked to be done for 9 questions which were based on safety management and its aspects in the company.
e. Recommendations for further improvement in safety management of the company.
f. Whether or not a behavior correction program would help to reduce accidents in the industry.
g. Recommendations for reducing accidents in organizations.
The questionnaire which was given to the 17 persons who met with the accident was different and consisted of the following questions.

a. His personal information.
b. General information about the accident.
c. General information about the injury.
d. How the accident occurred.
e. Information about his habits, physical fitness level, medical treatment undergoing, his normal daily routine and routine on the day of the accident.
f. Information on safety training, hazard communication, work planning, working conditions, operating system and physical hazards present.
g. Information about risk perception, working style, failure to respond to warning and stress level.
h. Information on communication of safety from management to him and vice versa.
i. Rating the safety management of the company on a scale of 1 to 10.
j. Any other information he would like to share.

Analysis of primary data collected

The primary data collected was divided into Qualitative and Quantitative data. The responses given by the workers who met with the accidents constituted the Qualitative data, whereas the rating given by the Factory Manager, Line Supervisor and Safety Officer constituted the Quantitative data. The Karl Pearson's correlation coefficient test was applied to the variables of the Quantitative data and the correlation between +VE and −VE variables were established. Details of the same are given in Appendix 3.