ABSTRACT

Accidents/near miss accidents in chemical industries are very common. Most of the incident occurred due to combinations of organizational and human factors. Literature review shows that the human error is one of the primary causes of accidents in process industries. This study aims to analyze the responsibility of the human for few industrial/domestic accidents which are received very little or no attention or publicity and also no proper assessment. The investigation procedure is to visit the spot whenever possible and then discussed with management and workers present at the time of accident and also at the present. This thesis incorporates the studies of the following incidents of accidents and survey,

Chapter 1

It describes the importance of human factors and human errors within process industries and its classifications. Detailed literature review and the objectives of the present work are reported.

Chapter 2

It consists of the description of an accident leading to bursting of a compressed natural gas (CNG) cylinder fitted to a passenger bus in a gas filling in India resulted in death of 1 person and injured of 4 persons. This chapter presents the incident, the human factor involved, safety issues, lesson-learned and useful recommendations.

Chapter 3

It describes the incident of the leakage of chlorine from a baby chlorine cylinder from small manufactured calcium hypochloride unit in a congested locality at Kolkata. The
leaked gas spread over the nearby area resulting in death of 4 persons and injured to 87 persons. This chapter describes the incident, the human factor involved and the lesson-learned. What-if analysis was used to identify the possible errors and the unsafe activities. Finally safe preventive measures are also discussed.

Chapter 4

This chapter deals with the workplace accident in phenol-formaldehyde runaway reaction in a resin plant. In this chapter the incident, errors identification and safety related issues are discussed. Job Hazard Analysis (JHA) and SWOT analysis are incorporated to find out the possible causes. The management practices are also discussed to prevent similar incidents in future.

Chapter 5

This chapter consists with an incidence of small fire breaks in an industrial gas plant, manufacturing acetylene gas. It explains the probable causes, preventive and corrective measures. What-if analysis and Cause – consequence analysis were used to identify the possible errors, and the unsafe activities. Emergency procedures are also discussed. Finally some useful recommendations are reported.

Chapter 6

The chapter deals with survey about the safety knowledge of the LPG auto drivers and LPG tank drivers during their occupational time. A structured questionnaires was developed and used for interview on LPG auto (N=150) and LPG tanker (N=150) drivers. Statistical analysis was carried out and some general useful recommendations are discussed.
Chapter 7

It discussed an incident due to aerosol insect repellent can which exploded in kitchen of a house resulted death of 1 house wife and injured 1 person. The probable causes are found out and some useful recommendations are described for future preventive measures.

Chapter 8

It consist the general conclusion based on the human factors responsible for accidents.