

Original article

Hazards Analysis of Routine Ship Towage operations in Indian Coastal Waters*

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Abstract

Main cause of accidents is just not always bad luck. Literature on safety has emphasised on the facts that accident finally leads to unfortunate consequence. The first step of risk assessment is to identify the hazards that are present. The Routine Ship Towage, also called harbour towage, is potentially a hazardous operation.

The main objective of this research is to identify and quantify the important factors impacting on the safety of routine ship towage operations in Indian coast. In doing so, initially, the existing literature on factors influencing safety of harbour towage operation was analysed to design questionnaire. Rest necessary data was collected through questionnaires. Finally, the factor analysis (Principal Component analysis) was applied to find grouped dimensions from identified hazard variables from literature and subsequently the critical analysis of incident type frequency, cause and consequences to get a clear picture of critical safety risk factors. As a result, the research found 20 criteria in 6 dimensions safety risk factors such as Crew Incompetency, Rough Weather, Poor Work Process, Suitability of Tug Type, Poor Safety Management System, and Poor Navigational Risk Assessment.

Keywords: Ship Towage, Tug Operation, Hazards

I. Introduction

In the seamanship a very seldom mentioned and elaborate category of small ships exist known as Tugboats. They are considered as ‘workhorses of ports’, very useful for assisting other vessels in mooring and un-mooring activities and providing tow service in manoeuvring within the ports and on all seas. In literature, the significance of these small ships on the whole maritime economy is often neglected but in fact their value is of paramount importance especially in manoeuvring during bad weather conditions in limited areas of world ports in particular. Now-a-days tugs are the important representative of port infrastructure in harbours worldwide and it is almost irremovable part of the business at some port in international relations without their utilization (BTA, 2010).

Accidents don’t just happen on its own but they are cumulative results of series of unsafe events, in context to ports such as unsafe water conditions, human error, machinery and equipment failure - anyone or a combination of these can turn random events into accidents, sometimes with fatalities (Alert!, 2008).

Ship Towage Operation involves one of the potentially hazardous operations i.e. mooring and unmooring of vessels at ports. These operations require an efficient team work as a prerequisite to secure safety. Crew members indulging in this operation must be efficiently trained and equipped. They must possess ample understanding of their role and responsibilities of their own as well as other team members (ETA, 2012).

From past four decades, researches have been conducted in order to have a better understanding of the effects on tug operations which are leading to many accidents in recent times. It is a point of consideration that there are different ways in operation of tug in towage operation and these mainly differ from place to place. Basically there are two methods to assist a ship, one is to push or pull a ship with tug fastened alongside the ship. In this method interaction forces have very small contribution. The other method is towing a ship on a line the tug is fastened to bow or stern to make a connection with towline near the bow in particular, in this interaction forces contributes in a major proportion (IMPA, 2013). The purpose of this research paper is to identify hazards associated with mooring and unmooring operations in routine ship towage in Indian coastal waters.

1.1. Traffic at Indian Ports

The port sector of India can be divided into two categories namely Major Ports and Non-Major Ports. Major ports are those ports which are run and governed by an act of Indian Parliament while on the other hand Non Major ports includes private ports, captive ports, ports which are owned by state government. In total there are 12 major ports in India along with 176 Non major ports stretched over 7,212 kilometres of the coastal line of India.

Ninety percentage of India’s international trade by volume and seventy percentages by value are represented by Major and Non-major ports in India. Data shows that 975 million tonnes of total traffic was handled by Indian ports in 2013-14, whereas 40% of the total traffic was handled by Non Major ports. There are other coastal vessels which are also contributing to this high traffic.

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