Investigation and Analysis of Accidents:

This report covers qualitative risk analysis of ship handling accident. Due to the lack of data quantitative risk analysis is not performed. But the same methodology can be used for quantitative risk analysis. Secion2 covers the graphical approaches to visualization of accidents.

Give an introduction to graphical approaches to visualization of accident:

Influence Diagram Approach (IDA):

This is a second generation of the Human reliability Assessment (HRA) technique, for the purpose of evaluating the probability of a human error occurring throughout the completion of a specific task. The motivation behind the HRA method is error identification, error quantification and reduction.

This is a simple visual and mathematical representation of a decision problem. The influence diagram(ID) is also called as a decision network. Influence diagrams offer an intuitive way to identify and display the essential elements, including decisions, uncertainties, and objectives, and how they influence each other. The ID is a directed acyclic graph with four types of nodes (decision, chance, value and deterministic) and the dependencies between the nodes are indicated with three types of arcs (Functional, Conditional and Informational arcs) between the nodes. This is a generalization of Bayesian network. It can be used for modeling and solving of probabilistic inference problems and decision making problem. Each variable is represented as a node in the graph. A marginal or conditional probability can be defined at each chance node, and a mathematical function associated with each of the other types of nodes. The ID aid the visibility of large number of interacting issues and their effects on the decision.

Bayesian Network Technique (BN):

The inherent uncertainty can be due to imperfect understanding of the domain, imperfect knowledge of the state of the domain at the time where a given task is to be performed, randomness in the mechanisms governing the behavior of the domain, or a combination of these. The reasoning can be justified in BN modeling. This method is flexibility, easy to use and appropriate for the assessment task. So, it can be used as a decision support system in the field of marine operations.