



Familiarity with Marine Navigation and Piloting System and Assessment of Its Main Components in Marine Operations

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Abstract

National and international authorities have worked for many years to improve safety in marine transportation. Improvements have been made in vessel design and construction, navigation aids, watch keeping guidelines, professional training, and marine traffic regulation. But in order to achieve universal adoption of these advances, establishment and enforcement of international conventions and national shipping laws and regulations is usually necessary.

Despite continuing efforts to improve operational safety, major shipping accidents involving all categories of vessels continue to occur. Most of these accidents have been attributed to human causes rather than purely mechanical, environmental, or other causes. Marine navigation and piloting system is a key to enhanced maritime safety.

Marine navigation and piloting form a complex operating system consisting of vessel and waterway systems; human operators; organizational culture and structure; and a supporting infrastructure for management, pilotage, policy and regulation, and professional development. System effectiveness depends heavily on human performance. Risk varies according to physical factors such as waterway dimensions; vessel factors including size and loading and etc.

The organizational structure for decision-making involving more than two vessels or on a port-wide basis is loosely integrated and mostly informal. Waterways management functions are spread among various government and commercial organizations. Marine traffic regulation is applied sparingly, but interest in this approach is growing. Technology already exists that could be used to better integrate and improve waterways management; International measures to improve commercial vessel safety seek to provide universal results, but they may not be employed fully by all maritime countries. The current understanding of operational risk is insufficient to guide improvements in the marine navigation and piloting system. Despite its many shortfalls, the system works most of the time. But when marine accidents occur, close examination of navigation and piloting practices is necessary.

Introduction

The marine navigation and piloting system is a large-scale sociotechnical system comprised of several subsystems: navigation and piloting tasks, technology, vessel and waterway systems, human systems, and organizational cultures and structures. These sub systems exist and interact within an operating environment supported by vessel and waterway systems, and characterized by substantial risk and recent changes. (Fig. 1)