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## Safety culture and hazard risk perception of Australian and New Zealand maritime pilots

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## Safety culture and hazard risk perception of Australian and New Zealand maritime pilots

### Abstract

A survey of the safety culture and hazard risk perception has been carried out involving 77 maritime pilots around Australia and New Zealand, representing more than 20% of the maritime pilots in each country, in proportional geographic distribution.

### Keywords

Safety, culture, hazard, risk, perception, Australian, Zealand, maritime, pilots

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**GeoQuEST RESEARCH CENTRE  
and  
SCHOOL OF EARTH & ENVIRONMENTAL SCIENCES**

**Safety Culture and Hazard Risk Perception of Australian  
and New Zealand Maritime Pilots**

**Final Report of a Research Project**

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## Abstract

A survey of the safety culture and hazard risk perception has been carried out involving 77 maritime pilots around Australia and New Zealand, representing more than the 20% of the maritime pilots in each country, in proportional geographic distribution. In 82% of the cases, interviews were carried out face to face, based on a questionnaire designed to be completed in less than one hour. Questions on four different aspects were asked, relating to each pilot's professional background, safety culture and perception of risks, navigation and pilotage hazards and their perception of the pilot's role. The responses indicated that there are issues with regulator identification, commercial pressures on pilots in some locations, incident reporting mechanisms and feedback, training opportunities and improved bridge resource management. In addition to reviewing comments made by pilots, the paper also presents recommendations for consideration in improving operational performance and safety of navigation in ports and regulated waterways.

# 1. Introduction

Seaports have been consistently identified by respective National, State, Territory and local governments of Australia and New Zealand as key links in the logistic chains between producers and export markets and have become the subject of increasing attention with regard to their management and operational efficiency. At the same time, marked differences have become apparent<sup>1</sup> in the manner in which ports are regulated and managed and how they deliver marine services to ensure safe navigation, even when located within the same administration.

Within the complexities of the shipping and ports industries with their multiplicity of competing interests, maritime pilots, with their independent status [5], have a critical role in ensuring the safe navigation of vessels in their care. They ensure the orderly transit of shipping in accordance with local regulations and rules of navigation. They protect port facilities and commerce defending the public interest and ensuring the conservancy functions of harbour authorities and protecting the environment.

In every navigable waterway of significance throughout the world, maritime pilots conduct ships between the sea and their berths during the part of the voyage that presents the greatest risk. Yet their role and function remains largely unrecognised. Previous studies of maritime pilotage in Australia, Canada, and the United States<sup>2</sup> have focussed on on-board issues relating to the master-pilot relationship, issues of fatigue, and restructuring of pilot service providers, but none appear to have considered the culture associated with pilots and pilotage. Nor has the impact of this culture been assessed in the context of the regulated environment of ports, harbours, and waterways in which ships are navigated. Commissions of Inquiry into maritime pilotage in Canada (1968)<sup>3</sup> and New Zealand (1974)<sup>4</sup> remain useful but are dated by significant changes in the commercial operation of shipping and ports and to the statutory and regulatory frameworks within which each operates. In addition, changes that have been made appear to have confused and obscured previously accepted lines of responsibility in pilotage administration so that pilots and ship masters in many places appear to operate in a vacuum of unshared responsibility. It was therefore decided to study and assess the current safety culture and risk perception among Australian and New Zealand maritime pilots.

Safety culture can be defined as the informal set of values and norms that control the way individuals and groups interact with each other and with people outside the organisation in order to improve the safety performance [9]. In this way, the values and practices that pilots share can be very useful in reducing operational, economic and environmental risks, particularly as human error is recognised as a major causal factor in marine accidents [10, 11]. Identification of areas for improvement in the safety culture and risk management provided by maritime pilots can contribute to a reduction in the incidence and severity of maritime accidents.

## The Function of Pilots

The function of maritime pilotage is to ensure the safe transit of shipping through coastal areas seen to pose greater risk than routine passages in the open sea. Pilots, trained in a particular area carry out their task in two discrete parts, each in fine balance with the overall responsibilities of the master of the ship under pilotage, so that a pilot is defined as “not being of the vessel, but having conduct of the vessel”. In practice, “conduct” by a pilot of a vessel comprises navigational direction of its courses and its speed.

Pilotage functions are an intrinsic part of the conservancy duties of harbour authorities established to facilitate commerce by ensuring safe access to ports by way of gazetted pilotage areas being subject to compulsory pilotage. In the latter part of the twentieth century, the historic conservancy functions of hydrographic surveys, dredging,

<sup>1</sup> Various reports of investigations into maritime incidents relating to vessels under pilotage in Australia by the Australian Transport Safety Bureau, e.g., Report No.157 *Amarantos* [1], Report No. 178 *South Australia Fortius*, [2], and reports by State maritime safety agencies (e.g., Maritime Safety Victoria), and in New Zealand by corresponding reports of investigations by the Transport Accident Investigation Commission, e.g., Report No.02-201 *Jody F Millennium* [3] and of the Maritime Safety Authority (now called Maritime New Zealand) and the recent introduction of extensive operating guidelines for effective risk management of navigation in New Zealand ports (*New Zealand Port & Harbour Marine Safety Code* [4] MSA)

<sup>2</sup> Marine Navigation and Pilotage National Research Council [6].

<sup>3</sup> Canada, The Bernier Commission [7]. *Report of the Royal Commission on pilotage*.

<sup>4</sup> New Zealand *Commission of Inquiry into Harbour Pilotage* [8].

establishment of navigation marks and aids, and regulation for the safety and convenience of shipping has become increasingly focussed on environmental protection. In all of this, the lynch-pin is the harbourmaster, whose regulatory role is internationally understood by ships masters.

In the regulation of all pilotage districts in Australia and New Zealand, excepting the regulation of Coastal Pilots, the phrase linking the duty of harbourmasters to the performance of pilotage may invariably be found in such statements, among others relating to mooring, berthing and unberthing, and working cargo, as "regulating the time and manner in which any vessel may enter into, depart from, or lie in the harbour<sup>5</sup>". It is for this reason, and for the related imperatives of conservancy management that this study examined the relationship of harbour authorities and harbourmasters as regulators with the activities of pilots.

#### Recent evolution of maritime pilotage in Australia and New Zealand

From the time of the federation of the States of Australia into the Commonwealth of Australia in 1901, the regulation of pilotage services had been the exclusive preserve of each State, and its harbour authorities, as a consequence of navigation and ports being the responsibility of each State. In New Zealand, the relationship between the national administration and each harbour authority was analogous to that of each State of Australia. In Queensland, coastal pilotage was also the responsibility of the State.

Until the mid 1980s, the statutes and regulation of pilotage services generally remained unchanged being both conventional and stable, recognisably similar to each other and to the statutes and regulations of other nations of the British Commonwealth. However, following the national adoption of policies of economic rationalism and competition, ports and harbours, in both Australia and NZ underwent significant change, and the principal importance of pilotage became a means of commercial revenue.

In this development, the historic rationale for maritime pilot service being related to conservancy and the safety of navigation have become increasingly blurred. In New Zealand, for example, the commercial ports, without exception, adopted pilot services as a source of revenue, and non-revenue conservancy functions passed to non-maritime regional authorities. In Australia, the commercialisation of pilot services has been partially implemented, usually by way of privatising pilot service providers which may be a port authority, corporatised port operator, private port operator, or pilot-owned service (of which there are four). An exception is the Coastal Pilots of Queensland whose services are privately owned and regulated by the Commonwealth<sup>6</sup>.

#### The current situation

A commonly used linkage between the statutes and regulations and the regulator of ports and harbours to ensure competent performance of pilotage services, is enshrined in "port operating licences" which are distinguished only by their opaqueness. For example, recent court cases found nothing odd in a pilot not having been properly licensed, or the terms of "port operating licences" not having been observed as historically understood. However, it seems clear from recent incidents and reports of investigations that the insertion of the statutory harbourmaster within a commercial organisation is contradictory and does not assist the legally defined independence of pilots in the conduct of their duties in assisting shipmasters.

However, notwithstanding substantial changes to the operating structures of ports in Australia and New Zealand, the harbourmaster remains the primary and first-line regulator of pilots and regulation of safety of navigation in the great majority of ports and harbours.

#### Definitions

For the purposes of this study, marine operations includes the management and movement of commercial shipping from the sea to the berth, the accommodation of shipping within the port, and its departure from the port.

Where used in this study, the following terms are defined as:

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<sup>5</sup> A phrase widely adopted by the worlds port authorities and little changed and from the time of its first usage in the Harbours, Docks and Piers Clauses Act (1847)

<sup>6</sup> Principally for reasons of their pilotage districts, in parts, operating in international waters and therefore subject to international protocols, such as in the Prince of Wales and the Great North East Channels north of Australia.



"Administration" being the national administration of shipping representing national interests to the International Maritime Organisation (IMO) which, for the Commonwealth of Australia is the Australian Maritime Safety Authority<sup>7</sup> (AMSA) and for New Zealand is Maritime New Zealand (MNZ).

"Regulator" being the authority responsible in each State or Territory for administering statutes and regulations for the operation of ports, shipping, and the safety of navigation.

"Port Authority": is the port-specific authority responsible in each port for the regulation of navigation, and the manner of entry, mooring, within each port and is vested in a the "harbourmaster" or person holding a similar title.

"Port Operator": is the commercial manager of each port, berthing structure, or place of mooring for the purposes of transshipping cargoes or providing services to shipping and is responsible for the management of port properties and port services.

"Marine Service Providers" are those service providers directly involved with the management, regulation, navigation, or control of shipping within port areas and pilotage districts and include:

"Towage services" are operators of tugs engaged in ship-assist functions in ports for berthing and unberthing ships.

"Pilotage services" are those providers of licensed or appointed pilots for the navigation of shipping (whether operated by the state or port authority or by private company)

"Lines handling services" are those entities providing line handling for mooring and unmooring ships

"Vessel Traffic Services" (VTS) are those services provided by State or port authorities (or by AMSA and MSQ within the Great Barrier Reef and Torres Strait region)

"Shipping Agents" are the commercial representatives of ship-owners in each port and of ships using the port<sup>8</sup>.

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<sup>7</sup> For the purpose of managing coastal pilotage in the Great Barrier Reef and Torres Straits Regions AMSA also acts as a regulator for those regions in which international protocols and Commonwealth legislation are applicable.

<sup>8</sup> In some smaller Australian ports roles may be duplicated (or even tripled) to include, for example; harbourmaster, pilot, shipping agent, port operator in the one person.