

Chapter 15

Conventional and Deep–Water Shipping Passages Along the Northern Sea Route

Andrey Afonin

Admiral Makarov State University of Maritime and Inland Shipping, Russia

Evgeniy Olkhovik

Admiral Makarov State University of Maritime and Inland Shipping, Russia

Alexander Tezikov

Admiral Makarov State University of Maritime and Inland Shipping, Russia

ABSTRACT

The chapter presents a description of conventional and deep-water shipping routes within the water areas of the Northern Sea Route (NSR). There are provided the evaluation of the hydrographical survey of the Arctic Ocean seabed with respect to navigational safety along with the summary of the principal factors affecting the efficiency and safety of shipping in the polar water. The chapter discusses the current situation and major development tendencies of the NSR, in particular the forecasted growth of navigation intensity, increase of the shares of high ice-strengthened heavy-tonnage vessels and hazardous cargoes in transportation, and spread of the year-round navigation zone to the East. Some of the research findings obtained during the previous decade at the Arctic Faculty of Admiral Makarov State University of Maritime and Inland Shipping are provided. The assessment of the effects of shallows and ice on the working capacity of the NSR for deep-draft vessels is provided.

INTRODUCTION

The chapter describes the traditional and deep-sea shipping routes of the Northern Sea Route (NSR). The estimation of hydrographic study of the bottom of the Arctic seas by the criterion of navigation safety is given. A list of the main factors affecting the efficiency and safety of navigation in the Arctic seas is provided. In the navigational respect, the NSR is a specific route due to the complex ice conditions,

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extensive areas with low depths, and insufficient hydrographic exploration. The chapter discusses the state and main tendencies of the development of the NSR. The principal trends include the expected increase in the intensity of navigation, increase in the share of large-capacity vessels with increased ice reinforcement, increase in the transportation of dangerous goods, and the extension of the year-round navigation zone to the eastern parts of the route. Over the past decade, the studies of the above-mentioned issues have been carried out at the Arctic Faculty of the Admiral Makarov State University of Maritime and Inland Shipping. The studies resulted in the elaboration of the measures aimed at reducing the probability of accidents associated with the landing of vessels on the strand when swimming with an extremely low water reserve under the keel in conditions of insufficient hydrographic study and difficult ice conditions. In this chapter, the authors present the estimates of the influence of shallow water and ice on the capacity of the vessels with a large draft.

BACKGROUND

Contemporary History of the NSR

The systematic study and development of the NSR started after 1930. In 1932, the Council of People's Commissars of the Union of Soviet Socialist Republics established the Main Directorate of the NSR with a purpose to make the final sea route from the White Sea to the Bering Strait, equip this route, keep it in good order, and ensure safety of navigation (Aleeva, 2003). The task was accomplished by 1960. In 1964, the functions of the Main Directorate of the NSR were transferred to the Ministry of the Navy. At that time, a coastal part of the NSR (traditional route) constituted a network of recommended routes used primarily during summer navigation period by the vessels of up to 6-7 m draft.

In Russia, the boundaries of the NSR are established by the Federal Law "On Amendments to Certain Legislative Acts of the Russian Federation Concerning State Regulation of Merchant Shipping on the Water Area of the Northern Sea Route" (Government of the Russian Federation, 2012). The Law recognizes the NSR as the water area adjacent to the northern coast of Russia, which covers the inland seas, the territorial sea, the adjacent zone, and the exclusive economic zone of Russia. In the east, the route is bounded by the Russia-USA maritime border and the parallel of the Cape Dezhnev in the Bering Strait. In the west, it is bounded by the meridian of the Cape of Desire to the Novaya Zemlya Archipelago, the eastern coastline of the Novaya Zemlya Archipelago and western boundaries of the Matochkin Strait, the Kara Gate, and the Ugra Bowl. Among the principal goals of the development of the Arctic, the State Program for Social and Economic Development of the Arctic Zone of the Russian Federation (Government of the Russian Federation, 2017) defines the creation of the conditions for the development of the NSR as a national transport route of Russia. Government of the Russian Federation (2008, 2011, 2013, 2015) and Government of Murmanskaya Oblast (2013) provide a broader definition of the NSR, i.e. the water areas of the seas in the Arctic Ocean.

Legal Aspects of Arctic Shipping

The boundaries of the NSR are being refined constantly. In 2018, the Maritime Safety Committee of the International Maritime Organization (IMO) approved a joint Russia-USA proposal on arranging a ship traffic in the Bering Strait according to a proposed scheme (Ministry of Transport of the Russian

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