Sustainable Development and Marine Transport in the Arctic Ocean
-A Perspective and Cold Regions Technology-

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ABSTRACT

The ice-diminishing Arctic Ocean has inspired the world's shipping industry to explore the feasibility of the historical Arctic routings, on the Northern Sea Route and Northwest Passage, at least as seasonal commercial operations. Both of the routes could significantly shorten travel distances between Europe, East Coast of America and Far East Asia. The feasibility of the Arctic routes is discussed, mostly based on the integrated outcome of the International Northern Sea Route Programme, which was conducted soon after the Russian declaration of the NSR as an international sea lane.

KEY WORDS: Arctic Ocean; Arctic shipping; Northern Sea Route; Northwest Passage; development of Arctic resources; Arctic environment.

INTRODUCTION

Responding to the world's growing demand for oil and gas, Arctic resources have been given much attention by the energy and shipping industries. In addition, global warming has accelerated oil and gas development in the Arctic, particularly in its western region. The ice-diminishing Arctic has inspired the world's shipping industry to explore the feasibility of the historical Arctic routes, the Northern Sea Route (NSR) and the Northwest Passage (NWP), as seasonal commercial sea lanes, at least.

The NSR is a waterway from the Atlantic Ocean to the Pacific Ocean along the Russian coast of Siberia, lying mostly in the Russian Arctic waters, which markedly reduces the distance by 40%, comparing with the traditional route via the Suez Canal. Before the beginning of the 20th century the Northern Sea Route (NSR) was known as the Northeast Passage (NEP), or Sevmorput in Russian. Along the NWP, the saving in travel distance of about 5,000nm from Asia to Europe by avoiding the Panama Canal eventually should prevail within the shipping industry.

The NSR was officially opened up in 1987 by Russia to the international shipping industry. Responding to this declaration, a comprehensive and multidisciplinary feasibility study of the NSR, called the International Northern Sea Route Programme (INSROP), started in 1993 and ended in 1999.

The paper summarizes the INSROP, referring to the feasibility studies on the Arctic routes, i.e. JANSROP I, II, ARCOP, and the Arctic Council's activities as well. JANSROP I was a collaborating project of Japan with the INSROP, while JANSROP II was an international feasibility study with a particular emphasis on Far East Russia and Asia issues, carried out soon after the INSROP. Arctic Operational Platform (ARCOP) was an EU project, dealing with the development of energy resources and marine transport in the Barents Sea.

Despite those feasibility studies, the challenges still remain. In an ice-diminishing Arctic Ocean, the damage risk to vessels, exploration and production rigs and ports along the Arctic routes would rather increase due to yearly fluctuating and unpredictable ice conditions with regional uncertainties, together with increased crushing possibility against floating large ice floe, icebergs, severe icing and wave actions.

Sustainable development in the Arctic poses particular challenge. It is right time to reconsider strengthening ocean governance in the Arctic on the view point of cold regions technology.

BACKGROUND

Northern Sea Route

Arctic routings have a long history of development. The first European overseas explorers were probably Irish monks in the 7th and 8th centuries. In the middle ages, as the endless quest for resources ventured further into the seas to the north of Europe and thence to the east and west, the dreams of adventurers turned ineluctably to the opening of new sea routes. Those early explorations in the Arctic by European seafarers were primarily for trade rather than for the glory of discovery. The search for two elusive new routes, termed the Northeast Passage and the Northwest Passage, marked the clear beginning of a new age of commerce. Since then, further persistent attempts at opening the Passages have been carried out.

Opening of the NSR was the vision of Peter the Great. Western parts of the NSR had been explored by Northern European countries, looking for an alternative shorter seaway to Asia. In 1619, Russia closed the Mangazeya seaway against English and Dutch invasions into Siberia. In 1932, a Soviet expedition led by O.Y. Schmidt was the first to sail all the way from Arkhangelsk to the Bering Strait. After a couple of more trials in 1933 and 1934, the NSR was officially opened. The Administration of the Northern Sea Route was set up in 1932, and since then it has supervised navigation and built Arctic ports. However, the opening of the NSR gradually took on the complexion of a strategic military project, and remained as a sea route primarily for Russian domestic shipping.

The NSR has an indisputable advantage in the travelling distance...