Consideration of the Safety Investigation Report for Research on the Safety Management of Small Domestic Shipping Companies in Japan
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1. Introduction
The Japan Federation of Coastal Shipping Associations (JFCSA) stated in its report (2014) that approximately 80% of the vessels used in the domestic shipping industry are small domestic vessels of less than 500 gross tons. The JFCSA stated that approximately 87% of a domestic shipping company’s capital is less than 50 million yen, indicating a small business scale (2014). Therefore, for an individual to solve these problems is difficult.

The aging of current active seafarers and a lack of new recruits has become an obvious problem throughout the industry in Japan. In 2006, the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MBMLIT) created a short-term course for the sixth-grade maritime officer [Navigation] qualification to increase the number of seafarers in Japan. This training is carried out as an educational programme at a national institution. From 2009, training for the course was conducted at private institutions approved by the MBMLIT. From 2014, the MBMLIT created a short-term course for the sixth grade maritime officer [Engineering] qualification, which can be carried out at private institutions.

Previous studies on domestic shipping seafarers in Japan noted that policies that reduce the boarding history necessary to seafarers qualifications increase ship accidents (Matsuo, 2013). However, these studies did not consider specific improvements in the Safety Management System for small domestic vessels.

The Ministry of Land, Infrastructure, Transport and Tourism introduced a new ‘Transportation Safety Management System’ (TSMS) to prevent accidents from human error. Still, for domestic shipping companies, fostering a culture of safety has been pointed out as difficult because of the distance between the vessel and that management company.

2. Objectives
In this study, to confirm previous studies that noted the risks to domestic vessels, authors investigate the accident rate of small domestic vessels. This study also aims to examine areas for improvement in the safety management (TSMS) of small domestic vessels less than 500 tons.

3. Methodologies
3.1 Accident trend of small domestic vessels in Japan
In this study, authors asked the Japan Coast Guard (JCG) to provide data on the number of vessels that are not engaged in international voyages. The current aggregation method was adopted in 2007. Consequently, authors have extracted from the data the number of ships that have been in accidents since 2007. In this study, domestic vessels with gross tonnage between 100 and 500 tons are hereinafter called ‘small domestic vessels’.

3.2 Consideration of the safety management for small domestic vessel in Japan by maritime accident
Previous research that compared the South Korean and Japan domestic shipping industries’ seafarer policies showed many similar situations for both domestic shipping industries (Lee, 2014). Therefore, to conduct safety management improvements in Japan’s domestic shipping industry, this study focuses on the safety management of the Korean domestic shipping industry.

In April 2014, the South Korean domestic passenger and cargo ship MV Sewol (cargo and passenger ship) capsized. This accident provides an opportunity to amend the law on South Korea’s Safety Management System.

Specifically, authors focus on the cause of the report of this accident, which provided an opportunity to amend the law. In this study, authors examine the cause of this accident as described by the Korea Marine Accident Inquiry Institute (2014). Since the size of the vessel is different, authors consider only matters relating to safety management for vessel.

4 Accident trend for small domestic vessels in Japan
Fig. 1 indicates the trend in the accident rate and the number of small domestic vessels in Japan.

![Fig. 1 Trend in the accident rate and the number of small domestic vessels](image)

The number of cargo vessels has declined more rapidly than that of tankers. However, accident rates are observed to be increasing. The accident rate of tankers is observed to have been in a reduced trend until 2013. However, in 2014, the accident rate increased rapidly.

5. Consideration of the safety management for small domestic vessel in Japan
5.1 Influence of industry structure
The Sewol accident report pointed out that the Sewol operator was not operating in a manner compatible with the Safety Management System and no Safety Manager was in charge. In the case of the Sewol, the ship owner and the operator were the same company; however, in the case of...
Japan’s domestic shipping, the operator, ship owner, management company, and manning company are typically different. In consideration of these points, to effectively operate Japan’s TSMS, clearly identifying the safety supervisor is needed for each involved company, and enhancing their cooperation is necessary. In addition, the shippers must understand safety activity by operating company.

5.2 Professional education for seafarers

The accident investigation report noted that the ship crew were unable to understand the lashing methods for the cargo. In addition, because stability characteristics are different in a car ferry, the seafarers should receive education on these different handling characteristics. The report illustrated that seafarers must have the expertise to embark a vessel. Thus, seafarers’ professional knowledge is an important element of safety management.

Currently in Japan, senior officers must complete a training course and practical training on the handling of hazardous materials before being allowed to board a tanker. Other ship crew are educated on the implementation expertise of each company. A sample from the MLIT’s Safety Management Manual for TSMS does not indicate the implementation of professional education in accordance with vessel type.

Therefore, in Japan, the TSMS of the Safety Management Manual should include the implementation of education for seafarers to ensure professional knowledge of each vessel.

5.3 Tightening of regulations of seafarers’ qualifications

The Sewol accident investigation report noted the lack of ship handling experience of the duty officer. Additionally, the report noted the questioning of the maritime officer’s qualifications for a vessel sailing in the same crowded waters with different navigational area. For these reasons, the report suggested that a maritime officer’s qualification should be of high rank.

In many cases, the navigational watch is done by a single person for small domestic vessels in Japan.

The Safety Management Manual of the TSMS has no item that indicates a method to judge the competence of the navigation officer. The decision on whether to entrust the navigation watch alone to a new recruit depends on the company (including the captain).

The problem related to long periods is whether the captain guides a new recruit during the navigation watch. One consideration is determining whether the navigation officers who carry out navigation watches alone are competent. Fuchi (2014) noted that features of navigation officers of small domestic vessels include a vague understanding of maritensive traffic rules and inadequate skills related to the radar.

Thus, examining the competence of the navigation officer in small domestic vessels is necessary.

6. Conclusion

1) The accident rate of small cargo vessels is increasing in the Japanese domestic shipping industry. In the small domestic vessels, approximately 76% of the vessels are cargo vessels. The situation is a dangerous one that requires immediate attention.

2) To effectively operate the TSMS of Japan, clarifying the individual who has responsibility as the supervisor of safety in each involved company is necessary, as is enhancing their cooperation. In addition, shippers must have an understanding of safety activity by operating company.

3) To realize safe management, having expert knowledge of the respective types of vessels that are operating is necessary. Implementing training is necessary to incorporate the Safety Management System.

4) For safe navigation, examining the competence of the navigation officer in small domestic vessels is necessary.

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