

Experimental Studies on the Holding Power of Anchors

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ABSTRACT

In this paper, the experiments of holding performance of anchors were carried out at the actual anchorage by using three kinds of anchors, JIS-A type (Hall's anchor), AC-14 type equipped widely in Japan and DA-1 type developed in Japan recently. And it is clarified that the performance of AC-14 type is inferior to that of JIS-A type at the anchorage where the sea bottom is the soft mud having the large percentage of the water content, while DA-1 type gives the high holding performance with stability. Therefore, from the viewpoint of the prevention of dragging anchor, attention has to be paid to the fact that AC-14 type is inferior to DA-1 type in the soft mud.

KEY WORDS: Dragging of anchor; Holding performance of anchor; Anchoring; Sea bottom soil.

INTRODUCTION

The ship will rely on the anchor at harborage in stormy weather, but a lot of aground accidents occur caused by the dragging of anchor today when various performances of the ship are improved. If the dragging has happened, the ship will suffer extensive damages in some cases. So, the study on the holding performance of anchors is very important from

the view point of prevention of dragging of anchor. For this reason, many researches concerning the holding performance of anchors were carried out by now. But in those researches, the holding power of anchors was measured through model experiments in the laboratory under the ideal situation, which differs from the soil at the actual bottom of the sea that piled up naturally. Then it is very important that the holding power of anchor be measured by using the anchor equipped on the ship at actual anchorage.

Japan Coast Guard equips AC-14(JIS-B) type anchor instead of JIS-A type (Hall's anchor) on the displacement type patrol vessels nowadays. Meanwhile, DA-1 type anchor was developed in Japan recently, but is not equipped widely yet. Then in order to confirm the holding performance of these anchors, experiments of the holding power of anchors were carried out at actual anchorages in SETO Inland Sea in Japan. The soil of the sea bottom at the anchorages is soft mud having the large percentage of water content. Many anchorages in Japan have the same nature of soil. And from the experimental results, it is clarified that the behavior and performance of anchors in the soft mud sea bottom are different from those in the sandy sea bottom(Teramoto et al.,2001 and Sato,2005).

EXPERIMENTS AT ACTUAL ANCHORAGES