1st Symposium on the Water research Center delft

Title project: Probability Design of the Entrance Channel

Research objectives

The research will focus on improving a new probabilistic model of entrance channel design, in which actual grounding probability of ship is identified. Apart from this an approach methodology will be formulated to aim at finding a good balance between probability of ship grounding and channel dimensions (depth and width) based on this model. Another objective of this research is to deal with the application of this model to the proposed upgrading of the entrance channel to the Coal Port of Cam Pha in Vietnam, as a case study.

Project outline

Introduction

A main hazard for the serviceability of ports is the obstruction of the entrance channel. If a ship strands in the channel, the entrance to the harbor is blocked. This entails a considerable loss of income of the port and to its image. On top of this damage to the environment by the release of hazardous cargo is quite imaginable. In such case which solution is the best for port planner in making investment that may avoid that hazard with acceptable budget? It is appeared that applying the probabilistic approach in optimal design of port capacity and serviceability is most appropriate.

Approach

Available computer models are used to build up the databases of ship motions. Based on these databases, some necessary probability density distribution functions of ship motions are defined by statistical analysis. Using Monte Carlo Method, a computer model uses these distribution functions to determine probability of ship grounding over a given period of the channel use. Several alternatives of channel dimensions corresponding to their probabilities of ship grounding are respectively given after the simulation. Finally, benefit - cost analysis is curried out, by relating to a required safety criterion, optimal dimensions of the channel are obtained.

Results

It is expected that the new computer model and methodology for probabilistic design of entrance channel will be developed.

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