

**ANALISIS PENGARUH OPERASIONAL ALAT BONGKAR
MUAT TERHADAP STABILITAS KAPAL MV.RATU DAMAI
KONVERSI DARI *BULK CARRIER* MENJADI *FLOATING
LOADING FACILITIES***

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ABSTRAK

Skripsi ini mengevaluasi dampak operasional alat bongkar muat terhadap kestabilan kapal MV. Ratu Damai, yang telah bertransformasi dari kapal pengangkut curah menjadi Fasilitas Pemuatan Terapung (*FLF*). Perubahan fungsi kapal memiliki pengaruh besar terhadap sifat stabilitasnya, terutama ketika beroperasi dengan muatan batubara atau bahan curah lainnya di lautan. Studi ini menerapkan metode kuantitatif dengan mengumpulkan data tentang operasi, spesifikasi kapal, dan parameter stabilitas. Analisis dilakukan dengan membandingkan stabilitas kapal (termasuk tinggi metasentris (*GM*), lengan penegak (*GZ*), dan sudut oleng) pada berbagai skenario operasional alat bongkar muat, seperti posisi *boom*, beban *conveyor*, dan pergerakan material. Temuan penelitian mengindikasikan bahwa pelaksanaan kegiatan bongkar muat, terutama penempatan dan distribusi berat *shiploader* serta *conveyor*, berpengaruh signifikan terhadap kestabilan kapal. Penempatan *boom* secara ekstrim atau beban yang tidak seimbang bisa menurunkan nilai *GM* dan *GZ*, berpotensi mendekati atau melebihi batas kriteria stabilitas yang ditetapkan oleh peraturan maritim. Penelitian ini menyarankan penerapan prosedur operasional standar yang lebih ketat, pelatihan kru yang memadai, serta penggunaan sistem pemantauan stabilitas secara langsung untuk menjamin keselamatan operasional MV. Ratu Damai sebagai *FLF*.

Kata Kunci: Stabilitas Kapal, Alat Bongkar Muat, *Floating Loading Facilities (FLF)*

ANALYSIS OF THE EFFECT OF OPERATIONAL *LOADING* AND *UNLOADING* EQUIPMENT ON THE STABILITY OF THE SHIP MV.RATU DAMAI CONVERSION FROM BULK CARRIER TO *FLOATING LOADING FACILITIES*

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ABSTRACT

This thesis evaluates the operational impact of loading and unloading equipment on the stability of the MV. Ratu Damai, which has been transformed from a bulk carrier to a Floating Loading Facility (FLF). The change in function of a vessel has a major influence on its stability properties, especially when operating with coal or other bulk materials at sea. This study applies a quantitative method by collecting data on operations, vessel specifications, and stability parameters. The analysis was conducted by comparing the ship's stability (including metacentric height (GM), enforcement arm (GZ), and roll angle) under various operational scenarios of loading and unloading equipment, such as boom position, conveyor load, and material movement. The research findings indicate that the implementation of loading and unloading activities, especially the placement and weight distribution of shiploaders and conveyors, has a significant effect on ship stability. Extreme boom placement or unbalanced loads can reduce GM and GZ values, potentially approaching or exceeding stability criteria limits set by maritime regulations. This study suggests the implementation of stricter standard operating procedures, adequate crew training, and the use of a live stability monitoring system to ensure the operational safety of the MV. Ratu Damai as an FLF.

Keywords: *Ship Stability, Loading and Unloading Equipment, Floating Loading Facilities (FLF).*