

ANALISIS *COURSE STABILITY INDEX* PADA KAPAL DI PERAIRAN DANGKAL

AXELA PUTRI CHUMAIRA

ABSTRAK

Perhitungan *Course Stability Index* (CSI) merupakan salah satu parameter penting untuk mengevaluasi kemampuan manuver kapal saat berlayar dalam menghindari gangguan di laut sehingga dapat meningkatkan keamanannya. CSI dipengaruhi oleh beberapa faktor, diantaranya: sarat air kapal, kedalaman air, *loading condition*, bentuk lambung, kecepatan, dan kondisi *trim/sink*. Perbedaan *loading condition* (*full load*, *half load*, *ballast*) ditinjau untuk mengetahui kemampuan manuver kapal di berbagai kondisi karena kapal tidak selalu beroperasi dalam keadaan penuh. Objek penelitian menggunakan Kapal LCT (*Landing Craft Tank*) dengan LPP 53 m, B 13.50 m, d 2.90 m, dan Cb 0.802 yang disimulasikan pada perairan dalam dan perairan dangkal. Metode penelitian yang digunakan adalah simulasi numerik dengan model matematika. CSI dianggap stabil apabila hasil perhitungan negatif (-), sebaliknya jika hasil perhitungan positif (+), maka CSI dianggap tidak stabil. Hasil perhitungan menunjukkan kemampuan manuver kapal di perairan dalam pada kondisi *full load* 0.011958, *half load* 0.010709 dan *ballast* 0.009389. Sedangkan untuk kemampuan manuver kapal di perairan dangkal, didapatkan hasil pada kondisi *full load* - 0.019056, *half load* 0.009990, dan *ballast* 0.019647. Berdasarkan hasil tersebut, kemampuan manuver Kapal LCT hanya stabil saat kondisi *full load* di perairan dangkal, yaitu sebesar -0.019056, sedangkan untuk 2 kondisi lainnya pada perairan dalam dan perairan dangkal, kapal kurang stabil.

Kata Kunci: *Course Stability Index* (CSI), *Loading Condition*, Simulasi Numerik

COURSE STABILITY INDEX ANALYSIS OF SHIP IN SHALLOW WATER

AXELA PUTRI CHUMAIRA

ABSTRACT

The calculation of the Course Stability Index (CSI) is one of the important parameter for evaluating a ship's maneuvering capability while sailing and avoiding disturbances at sea, thereby enhancing its safety. CSI is influenced by several factors, including: ship draft, water depth, loading condition, hull shape, speed, and trim/sink conditions. The differences in loading condition (full load, half load, ballast) are considered to assess the ship's maneuvering capability under various conditions, as ships do not always operate at full load capacity. This research used an LCT (Landing Craft Tank) Ship with principal dimensions: LPP 53 m, B 13.50 m, d 2.90 m, and Cb 0.802 which were calculated in deep waters and shallow waters. This research used numerical simulation of mathematical models as its method. CSI is considered stable if the calculation results are negative (–), otherwise if the results are positive (+), then CSI is considered unstable. The calculation results show that ship's maneuverability in deep waters under conditions of full load 0.011958, half load 0.010709, and ballast 0.009389. As for the ship's maneuverability in shallow waters, the results obtained at full load –0.019056, half load 0.009990, and ballast 0.019647. Based on the results, the maneuverability of the LCT Ship is only stable under full load conditions in shallow waters, which is –0.019056, while for other two conditions in deep waters and shallow waters, results showed that the ship is less stable.

Keywords: *Course Stability Index (CSI), Loading Condition, Numeric Simulations*