ABSTRACT

NUSA SETIANI TRIASTUTI. Development on Structure Design Alternative of Purse Seiner in Nanggroe Aceh Darusalam. Supervised by BUDHI HASCARYO ISKANDAR, SUGENG HARI WISUDO, JOHN HALUAN

The aim of this research was to prove the concrete structure could be used for keel, frame, and stern. The structure was analyzed into three dimension manners that used the package program based on finite element and the stability was analyzed using the Maxsurf package program. Compare the stability of the existing purseine ship structure to the combination structure of wood and concrete, indicated that the combination structure was more stable than the wood structure. The structure calculation was approached into two manners. The first method was called shell and the second method was called frame. Such method was done by means that the weight of ship was include into the weight of each element, the fixed load (crews, fishing gear and other equipments), temporary load (fish, food accommodation) at frame and deck beam. The research was done in the Lampulo Aceh at June 2004 in the 6.15 knot win speed. The load was calculated in the return trip condition which the ship carried full fishing and in depart trip condition the ship carried full accommodation load. The load variations of each load are $1, 2 \times DL + 1.6 \times LL + 0.9 \times WL$ and $1.2 \times DL + 1.6 \times LL$ that substituted as shell and frame method, until 8 load variation. The output of package program consisted of element forces of shell area, element forces of frame area, stresses shell area, joint displacement, joint reaction, moment and shear stress each structure element such as frame, deck beam, shear line and bilge, keel before inspection of joint concrete and wood connection between hull frame and shear line also keel and bow bilge. The result showed that the highest force of reinforced concrete of keel, frame and stern bilge was in return trip condition. The absorption test indicated that had high absorption result.

The concrete stress of keel, stern bilge and frame were not exceed the allowable stress of wood structure on deck beam, shear line at stern. The allowable stress concrete and wood based on Indonesia Concrete Standard (SNI Peraturan Beton) No. 3-2487-2002 and Indonesia wood Standard (SNI No. 5-2002). The maximum deflection of keel are not more than allowable deflection based on PKKI-NI 5-2002 is fulfil the standardization compare to maximum deflection, $f_{\text{max}} \leq 1/400 \, l$.

The wood stress on deck beam and shear lines that exceed the allowable stress should be arranged in double beam structure and necessary to establish the deflection standardization for fishing gear ship.

Keywords: purseiner, three dimension structure analysis, wood and concrete structure