RANCANG BANGUN PROTOTYPE SISTEM BILGA KAPAL LNG SBS. BALMOND

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ABSTRAK

Sistem bilga merupakan salah satu sistem penting pada kapal LNG yang berfungsi untuk mengumpulkan, mengalirkan, menampung, dan membuang air bilga yang berasal dari kebocoran, kondensasi, maupun sisa operasional di ruang mesin. Pemahaman mahasiswa mengenai desain, tata letak komponen, dan prinsip kerja sistem bilga masih terbatas karena proses pembelajaran lebih banyak dilakukan secara teoritis. Oleh karena itu, penelitian ini bertujuan untuk memperoleh desain sistem bilga kapal LNG SBS BALMOND berdasarkan Rules Class Biro Klasifikasi Indonesia (BKI), menghitung kebutuhan komponen sistem bilga, serta membangun prototype sistem bilga sepanjang 2 meter sebagai media pembelajaran. Metode penelitian yang digunakan meliputi studi literatur, pengumpulan data kapal, perancangan sistem menggunakan AutoCAD, perhitungan komponen sistem bilga berdasarkan *Rules Class* BKI, pembuatan prototype, dan pengujian prototype. Hasil penelitian menunjukkan bahwa desain sistem bilga telah memenuhi ketentuan Rules Class BKI dengan komponen utama berupa *bilge well, main bilge pipe, branch pipe, bilge pump, bilge holding tank, sludge tank, Oil Water Separator (OWS), sea chest, emergency bilge connection, serta valve*. Prototype yang dibuat mampu memperagakan alur kerja sistem bilga mulai dari pengumpulan air bilga hingga proses pembuangan melalui OWS. Berdasarkan hasil pengujian, prototype berfungsi dengan baik sesuai rancangan sehingga dapat digunakan sebagai media pembelajaran untuk membantu mahasiswa memahami desain, fungsi komponen, dan prinsip kerja sistem bilga pada kapal LNG.

Kata Kunci: sistem bilga, kapal LNG, prototype, Rules Class BKI, media.

DESIGN OF A TOURIST BOAT ON THE SUBAYANG RIVER, GEMA VILLAGE, KAMPAR KIRI

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ABSTRACT

The bilge system is one of the essential systems on an LNG vessel that functions to collect, transfer, store, and discharge bilge water generated from leakage, condensation, and machinery operation residues in the engine room. Students' understanding of the design, component arrangement, and working principles of the bilge system is still limited because the learning process is primarily conducted theoretically. Therefore, this study aims to obtain the bilge system design of the LNG SBS BALMOND vessel based on the Rules Class of the Indonesian Classification Bureau (BKI), determine the required bilge system components through engineering calculations, and develop a 2-meter bilge system prototype as a learning medium. The research method consisted of literature review, ship data collection, system design using AutoCAD, bilge system component calculations based on BKI Rules Class, prototype fabrication, and prototype testing. The results indicate that the designed bilge system complies with the BKI Rules Class requirements and consists of the main components, namely the bilge well, main bilge pipe, branch pipe, bilge pump, bilge holding tank, sludge tank, Oil Water Separator (OWS), sea chest, emergency bilge connection, and valves. The developed prototype successfully demonstrates the bilge system operation, starting from bilge water collection to the discharge process through the Oil Water Separator (OWS). Based on the testing results, the prototype operated properly according to the design and can be used as a learning medium to help students understand the design, functions of each component, and the working principles of the bilge system on an LNG vessel.

Keywords *Bilge system, LNG vessel, prototype, BKI Rules Class, learning media.*

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