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PREISPITIVANJE ZAJEDNIČKIH PRAVILA ZA PROVJERU GRANIČNE ČVRSTOĆE BRODSKOG TRUPA

Sažetak

Ovaj tehnički pregled najprije podsjeća na idealno elastično-plastočno modeliranje granične čvrstoće strukturnih elemenata. Potom daje pregled postupaka za ocjenu granične čvrstoće prema zajedničkim propisima za građnju trupa i prema standardima američkog instituta za naftu. U nastavku se uspoređuju idealizirani postupak sa granicom tečenja materijala prema američkim standardima i postupak sa graničnom čvrstoćom materijala prema zajedničkim propisima. Na kraju, dva su pristupa primjenjena na nedavno građene tankere i bulk carriere korištenjem iterativno inkrementalnog postupka za ocjenu granične čvrstoće broskog trupa. Usporedba dva pristupa ukazala je na razlike u vrijednostima granične čvrstoće. U zaključku se navodi da je ustanovljena značajna zaliha granične čvrstoće u odnosu na procijenjene vrijednosti prema idealiziranom postupku podržanog un zajedničkim propisima.

Ključne riječi: brodski trup, zajednička pravila za građnju trupa, API standardi, granična čvrstoća

THE CSR SHIP HULL GIRDER ULTIMATE STRENGTH CHECK PROCEDURE REVISITED

Summary

This technical note firstly reminds on the idealized elastic-plastic modeling of the ultimate strength of structural elements. Next it reviews the ultimate strength assessment procedures supported by the Common Structural Rules (CSR) and by the American Petroleum Institute (API) standards. In the continuation the study compares the idealized ultimate strength assessments according to the flow stress approach recommended by the API-579 standards and the minimal yield strength approach as it is adopted by the CSR. At the end, the two approaches are separately applied to recently build five tankers and three bulk carriers following the simplified iterative-incremental method for ultimate strength assessment of the ship hull girder. The comparison of the two approaches points to the differences in the calculated values of the hull girder ultimate strength of example ships when the higher flow stress is applied in assessment of elastic-plastic collapse instead of the minimal yield stress as it is recommended by CSR. The conclusion is that there are significant potential reserves in the hull girder ultimate strength with respect to the assessments based on the idealized computational procedure recommended by the CSR.

Key words: ship hull, common structural rules, API standards, ultimate strength