



FATIGUE OF SHIP STRUCTURAL DETAILS

The Society of Naval Architects and Marine Engineers has published the 90-page technical report Fatigue of Ship Structural Details. The material was compiled by Dr. Dominique Béghin as Chapter 17 for the revised edition of the book, Ship Structural Design, edited by Dr. Owen F. Hughes, and will ultimately be published in that form. It is released now as a T&R bulletin in order to make it available for use at an earlier date.

Like other welded structures made of steel or other metals that are subjected to cyclic loads, ship structure can fail through fatigue, even though the cyclic loads are lower than those upon which the design is based. Microscopic cracks are initiated that gradually increase in size until, after a certain number of cycles has been experienced, the cracks have become so large that fracture occurs. In other words, fatigue is a process of cycle-by-cycle accumulation of damage in a structure subjected to fluctuating stresses, going through several stages from the initial “crack-free” state to a “failure” state. The most important load effect parameter is the fluctuating component of stress, commonly referred to as stress range. The assessment of the fatigue life of ship structures is a complex task, all the more so as the various contributing factors have generally large uncertainties that are difficult to quantify, in particular when they involve such human factors as workmanship and quality of welding.

This publication is identified as Technical and Research Bulletin 2-31. It is issued as a CD and may be ordered through the SNAME web site (www.sname.org) or by contacting Tommie-Anne Faix (tfaix@sname.org) or by telephone 201-798-4800, x-3025) for \$50 (\$25 for SNAME members) plus shipping.