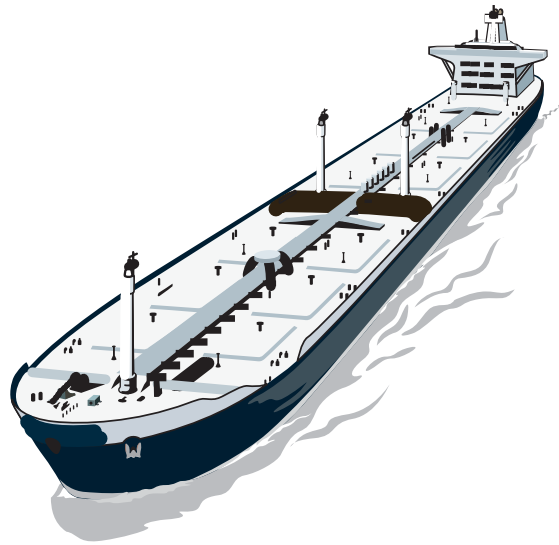


Short Course on **Fatigue and Fracture Analysis of Ship Structures**



February 9th -11th, 2005

To be held at
The Hilton Arlington & Towers
950 N. Stafford Street
Arlington, VA
22203

Organized on behalf of



Ship Structure Committee

By



BMT Fleet Technology Limited

Purpose

In recent years, tremendous advances have been made in the application of quantitative fatigue and fracture assessment procedures facilitating safe and cost-effective decisions in design, material specification and maintenance of structures. Aircraft, offshore structures and pipelines are a few examples of successful applications.

Several projects sponsored by the Ship Structure Committee (SSC) have demonstrated the applicability of these principles to ship structures. However, their practical implementation has been somewhat limited. Between 1998 and 2004, the SSC sponsored short courses designed to impart existing knowledge to those engaged in ship structural design and to demonstrate its application through practical examples. The success of these courses was such that a sixth course is now being offered.

Description

This three-day course begins with a review of the fatigue and fracture problems in ships over the last five decades and the traditional means of addressing them. This is followed by an introduction and explanation of quantitative procedures for assessing the fatigue and fracture performance of ship structures. These procedures are presented at various levels of complexity and sophistication so that an appropriate level can be selected commensurate with the need and available resources. The concepts discussed can be used at the design stage as well as in-service to select materials and size (determine) scantlings, to make maintenance and inspection decisions and to assess life extension. Throughout the course, “hands on” numerical exercises are used to demonstrate the application of the procedures. Special lectures on fabrication, inspection and measurement of fatigue response are planned.

Ample opportunities, formal and informal, will be available for discussion among participants and the course leaders.

Course Content

- Historical and current experience
- Recent developments in analysis, construction and materials
- Load components and ship response estimation
- Global and local stress analysis
- Fracture mechanics concepts and tests
- Fatigue design curve approaches and limitations
- Fracture mechanics approaches
- Residual stresses in fatigue and fracture analysis
- Characterisation of variable amplitude cyclic loads
- Miner’s damage summation rule
- Effect of environment on fatigue performance
- Fatigue resistant design details
- Damage tolerance/fitness for purpose analysis
- Impact of fabrication/construction tolerances

Course Leaders

The course material will be presented and discussed by internationally-recognized experts in the application of fracture mechanics-based methodologies to assess the fatigue and fracture performance of engineering components and welded structures, including ships.

The course leaders are:

Dr. Harold S. Reemsnyder
Consulting Engineer
Structural Durability and Integrity

Dr. Roger Basu
Manager, Risk and Reliability Department
American Bureau of Shipping

Mr. Aaron Dinovitzer
VP, Structural Integrity and Reliability
BMT Fleet Technology Limited

Dr. Sanjay Tiku
Fatigue Specialist
BMT Fleet Technology Limited

Additional industry guest lecturers will provide insight into actual fatigue issues they have faced and how they have dealt with them.

Who Should Attend

This course is geared toward the needs of naval architects, naval maintenance engineers and ship superintendents responsible for design optimization, material specification for new ships, decision making regarding ship safety for specified missions and for scheduling and implementing repairs. Senior students engaged in naval architecture studies would also benefit from this course.

Course Schedule

Wednesday, February 9th

Registration

Course Introductions
Historical Experience with Fatigue & Fracture
Material Properties and Behaviour
The Fatigue Design Process
Loads on Ships
Daily Examples
Evening Reception

Thursday, February 10th

Daily Overview
Stress Analysis
Residual Stresses
Predictive Methods for Crack Initiation and Propagation
Fatigue in Welded Connections
Effects of Fabrication and Detailing Practice on Fatigue & Fracture
Daily Examples

Friday, February 11th

Daily Overview
Environmental Effects
Fatigue Life Assessment Under Variable Amplitude Loading
Fracture Assessment
Introduction to the SSC Guide to Damage Tolerance Analysis
Introduction to the SSC Guide to Fatigue Design
Detailed Fatigue and Fracture Analysis
Examples

To Register

Please complete the registration form and submit it to:

Shannon Nicholson
BMT Fleet Technology Limited
311 Legget Drive
Kanata, ON, K2K 1Z8, Canada

Fax: +1 (613) 592-4950 **Tel:** +1 (613) 592-2830 or
E-mail: snicholson@fleetech.com

Registration

Registration will be limited to 55 participants. Advance registration is recommended and will be accepted on a first-come basis. The registration fee includes copies of all presentation material, including two SSC Guides, daily continental breakfast, coffee breaks and an evening reception. The registration fee of \$1,600 (\$1,300 before November 15th 2004) is payable by company purchase order, VISA, bank draft or certified cheque. Registrations become firm on November 31st, 2004. No refunds will be made thereafter.

Lodging

The Hilton Arlington & Towers
950 N. Stafford Street
Arlington, VA
22203

Tel: +1 703-812-5103
Fax: +1 703-812-5123
www.hiltonarlington.com

The Hilton Arlington & Towers is located near Ballston Commons with convenient metro, city and airport access. A single room rate of \$169 USD, excluding tax, has been negotiated for guests attending this function. A limited number of rooms are available at this rate, so guests are encouraged to reserve their room space early by calling the hotel directly.



Short Course on Fatigue and Fracture Analysis of Ship Structures

All prices are in US dollars.

Registration Fee: (before Nov. 15, 2004) \$1,300
(after Nov. 15, 2004) \$1,600

Name: _____

Company: _____

Address: _____

City: _____

State/Province: _____

Country: _____

Zip/Postal Code: _____

Tel: _____ Fax: _____

E-mail: _____

Payable to: **BMT Fleet Technology Limited**

Company Purchase Order No: _____

Amount \$ _____

Cheque/Bank Draft Enclosed:

Amount \$ _____

Charge to VISA:

Amount \$ _____

Name: _____

Number:

Exp. Date: _____

Signature: _____

The organizers maintain the right to cancel the course if insufficient registrations are received. In this event, a full refund will be made.