English summary

On extreme values

Esko Valkeila

Summary In the article we give a short introduction to extreme value theory and to the statistical inference related to it.

Key words: extreme values, statistical inference, structural reliability

Conditioning and independence

Ilkka Norros

Summary:Some basic aspects of probabilistic thinking and modelling are discussed. In particular, the significance of conditioning is highlighted by showing its role in the notions of hazard and information. This was written as an introductory talk to the seminar on Reliability of Structures.

Key words: probability, hazard, information

Risk-informed classification of systems, structures and components

Jan-Erik Holmberg and Ilkka Männistö

Summary: Risk-informed classification is based on utilising information from a risk analysis in a consistent way to select most cost-effective methods to control risk associated with systems, structures and components. An item's risk significance can be broken in two parts: probability of the failure and the consequence of the failure. Higher value in either will possibly mean a higher risk category, depending on the limit values for each category. Risk is controlled by assigning safety enhancing measures to each risk category. Risk-informed classification can be more efficient in reducing risks than the deterministic safety classification used in nuclear power plants. Nowadays also risk-informed classification is in use. Probabilistic safety assessments have shown that the risk significances of components and systems do not follow the simple assumption that components closer to the reactor have greater safety significance, and that many of the

components and systems that in the traditional analysis are assigned to a higher safety class have low risk importance.

The safety background of European structural design codes

Tor-Ulf Weck

Summary. This article describes the historical background for the European structural design codes especially the code on structural safety principles. The basic and most important recommendations are discussed. These include the target safety level, combinations coefficients and load combination rules when partial safety factor method is used. A more detailed description is given on the effect of distribution type on the reliability of structures and the safety factor to be used.

Reliability of ice-strengthened shell structures of ships navigating in the Baltic Sea

Pentti Kujala

Abstract. The aim of this paper is to determine the probability of ice damage on a hull for a ship operating in the Baltic ice conditions. Limit state equations for the permanent deflection of the plating and for the development of the three plastic hinge mechanism in the frame are presented. These equations are used for the safety index analysis, which is applied for transversely framed plating and transverse frames at the bow part of a typical ice-strengthened vessel. Long term ice load distributions are based on the full scale measurements.