

## English summary

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### Fatigue analysis based on probability theory

Roger Rabb

**Summary.** An important prerequisite for the maintaining and development of the competitiveness of our industry is a continuous effort to increase the safety and reliability of engines and equipment. To succeed in this ambition a good expertise of the fatigue analysis is a central point. Stresses can nowadays be calculated with great accuracy. However, the real bottlenecks are questions related to the fatigue strength of materials and to find good calculation criteria. One reason for this situation is of course the fact that the development of the fatigue analysis requires expensive testing. With the prevailing tight budget requirements it is often hard to convince a company management to allocate money for this kind of long-term development work. A necessary precondition for the development of accurate fatigue criteria is the understanding that the fatigue limit is a random variable. During the past two decades Wärtsilä has under the guidance of Dr. Rabb conducted plenty of testing and development work in this area. The achievements gained have been considered so important that Wärtsilä has made the unusual decision to publish a book to allow these research findings for educational purposes and to be used also by strength analysts in other companies.

*Key words:* fatigue, fatigue tests, spectrum tests, defect distribution, fracture mechanics