

## Preface

This document is a first attempt to put together in a consistent way some - certainly not all - of the rules, regulations, and explanations that are necessary for the design of new structures, or the assessment of existing ones from a probabilistic point of view. The document, of course, is also useful for background calculations of non-probabilistic codes.

From a probabilistic point of view designing new structures, or accepting existing ones as sufficiently safe, is the result of a decision-making process guided by some optimality criteria. This process links, in a logical and consistent way, the requirements and expectations of the client or owner of a structure, the loads and actions to be expected, the characteristics of materials to be used or found in the proposed or existing structure, the calculation models, the grades of workmanship expected or observed on the site, the behaviour of the users, and, finally, in an ideal case, the perceptions of society with respect to environmental impact and sustainable development.

The aim of this document is threefold: First, it is the attempt of a number of people interested in such an approach to see whether, at this point in time, the main problems in the development of such a document can be mastered. Second, it is intended to put a text into the hands of structural engineers who are willing now to apply new approaches in their work. Third, the Joint Committee on Structural Safety (JCSS) is convinced that such a document will spur the development of a Probabilistic Code covering all aspects of Structural Engineering.

There are people who advocate staying with traditional non-probabilistic codes, claiming that data is not sufficient for full probabilistic methods. There is much truth in the statement that often data is scarce. But this holds for both approaches. Let's face it: since data is often scarce in either approach, what remains is in essence probabilistic. Important in this respect is the meaning of the word "probability". In this document a "probability" is not necessarily considered as a "relative frequency that can be observed in reality". Such a straightforward interpretation is possible for dice and card games, but not for structural design where uncertainties must be modelled by complicated probabilistic models and which interact in a complex way. Here, probabilities are understood in the Bayesian way, expressing degrees of belief in relation to the various uncertainties, and suitable to decision making processes. At best, probabilities can be interpreted as "best estimates" of the relative frequencies, sometimes being wrong on the one side, sometimes on the other the degree of deviation from reality being a direct function of the state of knowledge. More discussion on this topic can be found on Annex X of Part 1, Basis of Design.

The present version of this JCSS Probabilistic Model Code document is available on the Internet at [www.jcss.ethz.ch](http://www.jcss.ethz.ch). It is intended that the document will be adapted and extended a number of times in the years to come. To get the best possible and efficient improvements all users are invited to send their questions, comments and suggestions to [www.jcss.ethz.ch](http://www.jcss.ethz.ch). The JCSS hopes that this document - the most recent of its pre-codification work since its creation in 1972 - will find its way into the practical work of structural engineers.

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