

Accidental impact by ships in the updated EN 1991-1-7

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Abstract

Ship collision is still one of the risk-prone expositions for bridges crossing navigable inland and maritime waterways. Within the preparation of the 2nd generation of the Eurocodes a 3rd (final) draft of an updated EN 1991-1-7 is edited [2]. Rules and background information for the Eurocode impact rules concerning inland and maritime waterway traffic are given. The rules and recommendations cover aspects like impact dynamics, load-indentation-functions, collision angles, collision probabilities and reliability criteria. For seagoing vessels new impact mechanics have been included. Information from some National Annexes and open questions are mentioned. Examples with determined ship impact forces are presented.

Keywords: EN 1991-1-7; ship impact; impact mechanics; collision probability; reliability criteria;

1 Introduction

Ship collision is still one of the risk-prone expositions for bridges crossing navigable inland and maritime waterways. Ship impact is treated in the present Eurocode EN 1991-1-7 (2006), Accidental Actions, [1], and is based on different experiences and research in Europe. Within the preparation of the 2nd generation of the Eurocodes a project team SC1.T11 of CEN TC 250 has worked out an update as prEN 1991-1-7 for which the 3rd draft has been edited, [2]. Concerning ship collision only minor changes have to be considered. Therefore, background of [1] is predominantly still valid for [2]. The updated code will be expected to be published in 2024 and has to be adopted by the member countries latest in 2027.



Figure 1. Ship bridge collision in river Rhine, 1989
(Source: BAW)

2 Eurocode EN 1991-1-7

The code for accidental actions started with ENV 1991-2-7 (1998) as an European pre-standard. After discussions and enquiries it became EN 1991-1-7 (2006), [1], as the European standard at present. An EN 1991-1-7 corrigendum AC (2010) and an EN 1991-1-7 2006 Amendment A1 in 2014 has been