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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3811-2008

Replacing GB/T 3811-1983

Design rules for cranes

起重机设计规范

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Foreword

GB/T 3811-2008 was issued on 30 April 2008 by the General Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of the People's Republic of China, and has been in force since 1 June 2009. It replaces GB/T 3811-1983.

The document is a recommended national standard: the /T in the designation marks it as recommended rather than compulsory. This edition is the official English translation published by the Standardization Administration; in case of any doubt about its contents, the Chinese original is authoritative.

Introduction

The introduction sets out how the group classification is to be used between purchaser and manufacturer. The user shall propose appropriate requirements for the group classification of the crane, and where possible the group classification of a mechanism as a whole should be further clarified, so that the manufacturer can design and build to those requirements.

The group classification of the crane as a whole depends on two factors, the class of utilization and the state of loading. The class of utilization indicates whether a crane has a light or a heavy duty and is determined by the total number of operating cycles: the product of the estimated number of in-service years, the average number of days of use per year and the average number of operating cycles within each working day. The state of loading

indicates the magnitude of the load acting on the crane and is determined from the load spectrum factor. Neither calculation calls for a high degree of accuracy, and an estimate would suffice.

The group classification of a mechanism as a whole is the assessment of its loading and operating conditions, determined by the class of utilization - its design life and number of working hours - and by the state of loading.

Where the required data of the crane are not available and the group classification cannot be calculated or selected by those methods, the user may confine himself to stating the group classification in which the crane or its mechanisms are to be classified by reference to the examples in Annexes A and B. Those annexes are not binding: they give referential examples that may make the selection easier. The group classification specified in the tender document and the purchase order shall be provided and confirmed by the user.

On the duration of use of a crane, the class of utilization specified in this standard does not constitute a guaranteed value of the actual duration of use.

1 Scope

China's national design code for cranes, and one of the largest technical standards the country publishes: 363 pages, nine clauses and twenty-three annexes. A crane is not designed once but for a working life, and the question that shapes the whole document is how hard that life will be. Two identical bridge cranes, one lifting a full load every few minutes in a steelworks and one lifting an occasional load in a maintenance bay, wear out on completely different timescales, and designing both to the same rule means overbuilding one and losing the other. The standard's answer is the group classification: the crane and each of its mechanisms are placed in a class from the total number of operating cycles and the shape of the load spectrum, and every subsequent calculation - loads and load combinations, structural strength, rigidity, buckling and fatigue, mechanism and gear design, motor selection, overturning stability, safety against wind - is scaled to that class. It establishes the guidelines to be complied with in designing the crane as a whole and its structures, machinery, electrics and safety, specifies the requirements and rules of design and calculation, and may serve as the technical basis for analysing and evaluating a design. It applies to overhead-type, jib-type and cable-type cranes, without covering the special issues of those types, and may be used as a reference for other kinds of crane.

This standard establishes the necessary guidelines which shall be complied with during the design of the crane as a whole and its parts such as structures, machinery, electrics, safety, etc., specifies the requirements and rules of design and calculation, and may be used as technical basis for the analysis and evaluation of the design.

This standard is applicable to overhead-type, jib-type and cable-type cranes, but special issues in the design of the above-mentioned cranes are not involved. This standard may