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## **Risk Assessment for Amusement Ride – General Principles**

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## Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard was proposed by and under the jurisdiction of National Technical Committee for Standardization of Ropeway and Amusement Facilities (SAC/TC 250).

Drafting organizations of this Standard: China Special Equipment Inspection Institute, Jiangsu Province Special Equipment Safety Supervisions and Inspection Institute, Special Equipment Inspection and Research Institute of Shandong Province, Zhongshan Golden Horse Technology Amusement Equipment Co., Ltd., Wenzhou South Amusement Equipment Engineering Co., Ltd., Shenzhen Huaqiang Fangte Culture & Technology Group Co., Ltd., Shenzhen Overseas Chinese Town Culture Tourism Technology Co., Ltd., Shanghai Special Equipment Supervision and Inspection Technology Research Institute, Chongqing Institute of Special Equipment inspection and Research, Guangdong Institute of Special Equipment Inspection and Research, Zhejiang Special Equipment Inspection and Research Institute, Wuhan Special Equipment Supervision and Inspection Institute, and Beijing Shibaolai Play Equipment Co., Ltd.

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# **Risk Assessment for Amusement Ride – General Principles**

## **1 Scope**

This Standard specifies the basic principle, procedures of risk assessment for amusement facilities, confirmation of assessment objects and factors, information collection, hazard identification, risk assessment, risk control, re-evaluation, risk assessment organizations and personnel, and risk assessment documents.

This Standard is applicable to the risk assessment of amusement facilities.

## **2 Normative References**

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB 8408 Amusement Device Safety Code

GB/T 20002.4-2015 Drafting for Special Aspects in Standards – Part 4: Safety Aspects for Their Inclusion in Standards

GB/T 20306 Amusement Devices Terminology

Regulations on safety supervisions on large-scale amusement facilities (No.154 Command from the General Administration of Quality Supervision, Inspection and Quarantine)

## **3 Terms and Definitions**

The following terms and definitions stipulated in GB/T 20002.4-2015 and GB/T 20306 are applicable to this document. For ease of use, the following terms and definitions in GB/T 20002.4-2015 are repeatedly listed.

### **3.1 Safety**

The state eliminating the unacceptable risk.

intended use, reasonable foreseeable use and etc.

**6.2** The assessment factor shall consider the equipment factor, personnel factor, environment factor and etc. during the whole life cycle period from design to reject.

**6.3** The equipment generally includes but not limited to the following factors:

- a) Damage, failure, etc. existing in the equipment components and subsystem;
- b) Different operating modes;
- c) Moving range of the amusement facilities.

**6.4** Personnel generally includes but not limited to the following factors:

- a) Operator and Maintenance personnel with different training, experience and ability;
- b) Player's gender, age, height and weight;
- c) Operator's and maintenance personnel's working space;
- d) Amusement facilities player's moving range and riding space.

**6.5** Environment generally includes but not limited to the following factors:

- a) The requirements of temperature, humidity, weather, etc. for the operating of the amusement facilities;
- b) The altitude requirements for the operating of the amusement facilities;
- c) The indoor and outdoor operations of the amusement facilities.

## **7 Information Collection**

**7.1** Information collection is a key step for the risk assessment; the accuracy, validity and comprehensiveness of the data are directly related to the correctness of the risk assessment results.

**7.2** Amusement facilities risk assessment requires to collect the equipment own technical requirements, use condition, and the like information; generally, it includes but not limited to the following contents:

- a) Relevant amusement facilities regulation standard; Regulations on Safety Supervisions on Large-Scale Amusement Facilities; GB8408, etc.;
- b) Relevant accident records and cause analysis for the same type of amusement

## 10 Risk Control

**10.1** If the risk evaluation results require to reduce the risk, the risk control measures shall be taken; corresponding measure shall be taken according to the specific situations of the different equipment.

**10.2** The measures taken in the design phase are superior to those taken by the user during the use phase.

**10.3** The steps taken in the design phase for risk control can refer to Figure 2. Firstly, in the design phase, take essential safety design measures, security protection and supplementary protection measures and use the usage information, warning sign, safety prompt etc. to eliminate or reduce the risk; if there is still risk after taking the measures, it shall provide relevant requirements and instructions in the operation manual.

**10.4** The steps taken in the use phase for risk control can refer to Figure 3. According to the amusement facilities in the use phase, carry out relevant organizational measures, use safety guards and individual protective equipment, and training to eliminate or reduce the risk.

**10.5** It is not suitable to use additional protective device, individual protective equipment and provide the users information to replace the design improvement.

**10.6** If there is larger residual risk after taking the risk control measures, the equipment shall be rejected; if the residual risk is in the acceptable range after taking the risk control measures, then make daily, monthly, yearly inspection plan and strengthen the supervision.

facilities regulations and standards, have corresponding professional knowledge (such as machinery, electrical, control, civil engineering, hydraulic, etc.), have more than 3 years' working experience in the amusement facilities industry; and take the training on the risk assessment technology and standard.

## **13 Risk Assessment Document**

### **13.1 Overview**

**13.1.1** Risk assessment document consists of program or operating instructions, risk assessment records and risk assessment report.

**13.1.2** Risk assessment records and report shall be accurate and complete, and shall be signed by the corresponding responsible persons.

**13.1.3** Risk assessment records and report shall be stored for a long term till the amusement facilities are rejected.

### **13.2 Program and operating instructions**

Risk assessment program and operating instructions shall be prepared as per the requirements of relevant regulations, standard and this document.

### **13.3 Risk assessment records**

The risk assessment records shall include the on-site records of risk assessment, meeting information, and the like process documents; generally, it includes but not limited to the following factors:

- a) Risk assessment object and description;
- b) Specific risk assessment method;
- c) Risk evaluator, etc.

### **13.4 Risk assessment report**

**13.4.1** The amusement facilities risk assessment process and results shall form the risk assessment report, and store as the technical data.

**13.4.2** Risk assessment report generally includes but not limited to the following contents:

- a) Risk assessment object, such as amusement facilities name and subsystem;
- b) Relevant information and introduction of amusement facilities, such as technical parameters, manufacture organization, design organization, etc.;

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