

ICS 27.140
CCS P26

NB

**ENERGY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

NB/T 10495-2021

Code for manufacture, installation and acceptance of shiplift

升船机制造安装及验收规范

Issued on: January 7, 2021

Implemented on: July 1, 2021

Issued by: National Energy Administration of the PRC

Table of Contents

6.1 Embedded Parts	44
6.2 Main Wire Rope Hoist Lifting System and Winch	48
6.3 Rack and Pinion Drive System and Safety Mechanism	51
6.4 Hydraulic Drive System and Safety Mechanism	57
6.5 Ship Chamber Structure	60
6.6 Ship Chamber Equipment	64
6.7 Counterweight System	69
7 Electrical Equipments	72
7.1 Assembling in Factory	72
7.2 Site Installation and Test	72
8 Commissioning and Acceptance	79
8.1 General Requirements	79
8.2 Pre-assembling and Test in Factory	79
8.3 Site Commissioning and Test	80
8.4 Acceptance	84
Appendix A Requirements for Materials and Nondestructive Testing of Racks, Columns and Pinions	85
Explanation of Wording in This Code	89
List of Quoted Standards	90
Addition: Explanation of Provisions	95

Foreword

This document was issued on 7 January 2021 by the National Energy Administration of the PRC and takes effect on 1 July 2021.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 27.140, Chinese classification P26.

NB/T 10495-2021 Code for Manufacture, Installation and Acceptance of Shiplift is an energy industry standard of the People's Republic of China, issued by the National Energy Administration on 2021-01-07 and implemented from 2021-07-01.

Classification data printed on the cover: ICS 27.140, CCS P 26; the standard carries the

engineering construction classification mark P and is a recommended (/T) energy industry standard.

The standard was published by Announcement No. 1 of 2021 of the National Energy Administration, which approved and released 320 energy industry standards, including this code (Attachment 1), 113 foreign-language editions of energy industry standards, starting with Carbon steel and low alloy steel for pressurized water reactor nuclear power plants - Part 7: Class 1, 2, 3 plates (Attachment 2), and 5 amendment notices of energy industry standards (Attachment 3). The announcement is dated 7 January 2021.

In the catalogue of industry standards annexed to the announcement (Attachment 1), NB/T 10495-2021 is listed as item 12, with no superseded standard and no adopted international standard, approval date 2021-01-07 and implementation date 2021-07-01.

This code was developed in accordance with the Notice of the National Energy Administration on Issuing the 2015 Plan for the Formulation and Revision of Energy Sector Industry Standards (Guo Neng Ke Ji [2015] No. 283). The drafting group carried out extensive investigation and research, summarized practical experience and prepared the code on the basis of wide consultation.

The main technical contents of this code are: general provisions; terms; basic requirements; manufacture and installation of lock head gates and hoists; manufacture of metal structures and mechanical equipment in the ship chamber section; installation of metal structures and mechanical equipment in the ship chamber section; electrical equipment; and commissioning and acceptance.

This code is under the administration of the National Energy Administration, was proposed by China Renewable Energy Engineering Institute, and its specific technical contents are interpreted by the Energy Industry Standardization Technical Committee on Hydropower Metal Structures and Hoists (NEA/TC21).

Comments and suggestions arising during the implementation of this code should be sent to China Renewable Energy Engineering Institute, No. 2 Liupukang North Street, Xicheng District, Beijing, postcode 100120.

Chief development organizations: China Gezhouba Group Co., Ltd.; China Renewable Energy Engineering Institute; China Gezhouba Group Electromechanical Construction Co., Ltd.; China State Shipbuilding Corporation Wuhan Shipbuilding Industry Co., Ltd.; China Gezhouba Group Machinery and Ship Co., Ltd.

Participating development organizations include: Huaneng Lancang River Hydropower Inc.; China Three Gorges Corporation; Wuchang Shipbuilding Heavy Industry Group Co., Ltd.; China Erzhong (Deyang) Heavy Equipment Co., Ltd.; the 712th Research Institute of China State Shipbuilding Corporation; Xi'an Aerospace Automation Co., Ltd.; Wuhan Marine Machinery Plant Co., Ltd.; Taiyuan Heavy Industry Co., Ltd.

Structure of the Code

The code is organized in eight chapters: 1 General Provisions; 2 Terms; 3 Basic Requirements; 4 Manufacture and Installation of Lock Head Gates and Hoists; 5 Manufacture of Metal Structures and Mechanical Equipment at Ship Chamber; 6 Installation of Metal Structures and Mechanical Equipment at Ship Chamber (from page 44); 7 Electrical Equipments; 8 Commissioning and Acceptance; followed by Appendix A, the explanation of wording, the list of quoted standards and the explanation of provisions.

6.1 Embedded Parts - requirements for the embedded parts of the ship chamber section, beginning on page 44.

6.2 Main Wire Rope Hoist Lifting System and Winch - beginning on page 48.

6.3 Rack and Pinion Drive System and Safety Mechanism - beginning on page 51.

6.4 Hydraulic Drive System and Safety Mechanism - beginning on page 57.

6.5 Ship Chamber Structure - beginning on page 60.

6.6 Ship Chamber Equipment - beginning on page 64.

6.7 Counterweight System - beginning on page 69.

Chapter 7 Electrical Equipments begins on page 72.

7.1 Assembling in Factory - beginning on page 72.

7.2 Site Installation and Test - beginning on page 72.

Chapter 8 Commissioning and Acceptance begins on page 79.

8.1 General Requirements - beginning on page 79.

8.2 Pre-assembling and Test in Factory - beginning on page 79.

8.3 Site Commissioning and Test - beginning on page 80.

8.4 Acceptance - beginning on page 84.

Appendix A Requirements for Materials and Nondestructive Testing of Racks, Columns and Pinions - beginning on page 85.

Explanation of Wording in This Code - page 89.

List of Quoted Standards - page 90.

Addition: Explanation of Provisions - page 95.

1 Scope

NB/T 10495-2021 governs the manufacture, installation and acceptance of shiplifts on

Chinese hydropower and navigation projects. A shiplift carries vessels past a dam in a water-filled chamber raised and lowered as a single moving mass of thousands of tonnes, and its safety depends on precision in every component - the racks and pinions or wire ropes and counterweights that carry the chamber, the locking and safety devices that hold it if a drive fails, and the gates that seal it against the reservoir. The code sets the general provisions and defined terms, then the general requirements on materials and their certification, welding procedure and welder qualification, corrosion protection, and embedded parts. It covers manufacture component by component: the gates and hoists of the upper and lower heads, the ship chamber structure, the rack and nut columns, the wire ropes, sheaves and counterweights, the hydraulic systems, and the electrical and control equipment, with the dimensional tolerances and the factory inspection and testing for each. Installation on site follows, with the survey control, the alignment of rack columns and guides to the tolerances that a vertically moving chamber demands, and the assembly sequence. Commissioning covers the no-load, balanced-load and full-load trials and the testing of the safety systems. Acceptance at each stage and the handover documentation close the code.

2 Terms

2.0.11 service gate of ship chamber: the gate arranged at the upstream and downstream ends of the ship chamber which, when closed, seals the water body in the ship chamber and, when opened, forms the waterway through which vessels enter and leave the ship chamber.

2.0.12 bulkhead gate of ship chamber: the gate arranged on the ship chamber and used for the maintenance of the service gate of the ship chamber.

3 Basic Requirements

3.1 Technical documents. 3.1.1 The following documents shall be available for the manufacture of a shiplift:

3.1.1 Item 1: design drawings, mainly including general drawings, assembly drawings and part drawings.

3.1.1 Item 2: quality certificates of steel, welding materials and protective (coating) materials.

3.1.1 Item 3: quality certificates of purchased standard parts and non-standard subcontracted parts.

3.1.1 Item 4: electrical schematic diagrams, component layout drawings, internal and external wiring diagrams, software flow charts and software function description documents.