

INDUSTRIAL STANDARDS OF ELECTRIC POWER OF

PEOPLE'S REPUBLIC OF CHINA

中华人民共和国电力行业标准

The Code of Erection and Acceptance of Electric Power

Construction Section of Steam Turbine Set

电力建设施工及验收技术规范汽轮机机组篇

DL 5011-92

Compiled by: Infrastructure Department, Federation of Electric Power Enterprises of China

Approved by: Ministry of Energy of P.R.C

Beijing 1993

Note

This book is the English translation of The Code of Erection and Acceptance of Electric Power Construction Section of Steam Turbine Set DL5011-92 In the event of any inconsistency between the Chinese-language text of the Code and the present English-language text of the Code, the Chinese-language text shall be taken as ruling.

Ministry of Energy, P. R. China

**Notice on Promulgation of Industrial Standard of Electric Power
The Code of Erection and Acceptance of Electric Power Construction
Section of Steam Turbine Set**

NYJ [1992] 597

To adapt to the requirement for installation and commissioning of electric steam turbine sets, we consigned Infrastructure Department of Federation of Electric Power Enterprises of to organize the agencies concerned to revise The Code of Erection and Acceptance of Electric Power Construction - Section of Steam Turbine Set (SDJ53-83) issued in 1983. In the revised version, which is named as "Code of Erection and Acceptance of Electric Power Construction - Section of Steam Turbine Set" (DL5011-92) for electric power industry, some clauses are modified, and some new clauses related to imported models (300MW and 600MW) are added. Now, the revised version is issued and comes into effect, superseding the previous version (SDJ53-93). Please pay attention to accumulating experience during the enforcement of the new version and keep the Infrastructure Division of MER and Infrastructure Department of Federation of Electric Power Enterprises of China informed of any problems.

June 23, 1992

Contents

1 General Provisions	1
1.1 General Regulations	1
1.2 Equipment and Materials	1
1.3 Requirements for Coordination in Civil Work	3
1.4 General Regulations for Erection	4
2 Main Body of Steam Turbine	7
2.1 General Regulations	7
2.2 Requirements for Foundation	7
2.3 Bedplate and edge iron	8
2.4 Sliding Pin System of Cylinder and Bearing Seat	10
2.5 Bearing and Oil Catch	16
2.6 Turbine Rotor	22
2.7 Equipment Installation for Through-Flow Part	27
2.8 Rotor Turning Gear and Reducer	33
2.9 Covering Steam Turbine	36
2.10 Secondary Concrete Pouring for Foundation	40
2.11 Acceptance	41
3 Generator and Exciter	42
3.1 General Regulations	42
3.2. Bearing Seat and Bearing	45
3.3. Stator	46
3.4 Generator Rotor	49
3.5 Adjusting Stator Position and Sealing End Cap	52
3.6 The installation of the spindle seal unit in hydrogen cooling and water and hydrogen cooling generator and the gas pressure test for the whole unit	54
3.7 The supporting seat of water input and output and cooler	57
3.8 Cooling water system	61
3.9 The exciter base	63
3.10 The project acceptance	64
4 Regulatory system and oil system	65
4.1 General regulations	65
4.2 Main centrifuge pump	66
4.3 The mechanism for adjusting	67
4.4 Steam gate and gearing structure	72
4.5 Protector	75
4.6 Oil system	78
4.7 The seal oil system of the hydrogen cooling generator	87
5 Pipes in Steam Turbines	90
5.1 General Regulations	90
5.2 Special accessories	90
5.3 Installation of pipes	91
5.4 Acceptance	94

6 Auxiliary equipments	94
6.1 General Regulations	94
6.2 Condenser	95
6.3 Ejector	101
6.4 Heat exchanger	103
6.5 Box tank and deaerator	105
6.6 Pressure reducer and attemperator	107
7 Auxiliary Machinery	108
7.1 General Regulations	108
7.2 Installation of auxiliary machinery	108
7.3 General centrifugal pumps	114
7.4 Water supply pump and supporting devices	118
7.5 Vertical pump	125
7.6 Deep-well Pump	135
7.7 Water tower air-blower	137
7.8 Rotary strainer	139
8 Other Works Related to Steam Turbine	140
8.1 Bridge Crane	140
8.2 Insulation and Painting of Turboset Equipment	146
8.3 Finishing Panel, Platform, Ladder and Cover Plate of Turbine	148
8.4 Turbine Meters	149
9 Adjusting, starting, commission of the turbo-unit	150
9.1 General Regulations	150
9.2 Commissioning of accessory mechanical part	152
9.3 Blowing and Flushing of the steam water pipeline	157
9.4 Tightness testing on the vacuum system of the steam turbine	158
9.5 Commissioning of the auxiliary equipment for the steam-turbine	158
9.6 Commissioning of oil system and oil circle	161
9.7 General rule for whole and commissioning	164
9.8 Regulatory system before steam turbine operation and adjusting and experiment of auto protection unit	165
9.9 Start of steam turbine generator unit and operating without load	168
9.10 Feeding hydrogen of generator and the operation of hydrogen system.	173
9.11 Commissioning of generator with inner water-cooled stator and rotor and water hydrogen and hydrogen -cooled generator	175
9.12 Turbo-unit running with load	176
9.13 Inspection and Accepting of the Project	179
Appendix A Construction requirement for concrete underlying block of the steam turbine bed plate	180
Appendix B The proportion of epoxy resin sand slurry	181
Appendix C The proportion of pneumatic cylinder painting	181
Appendix D Variety and applicable scope for sealing material	183
Appendix E Variety and applicable scope of commonly used grease	184
Appendix F Physical performance of common material for bolt in steam turbine	185

Appendix G	Calculating formula for finding central drooping arc with steel wire	186
Appendix H	Testing Method for the inner stress of brass tube used in heat-exchanger....	186
Appendix I	Painting requirement for the pipeline in newly established power plant.....	187
Appendix J	Testing Standard for the tightness of hydrogen system in the generator.....	188
Appendix K	Contrast table of legal measuring unit currently used in this specification and measuring unit for old project used in original specification.....	192
Appendix L	Basic contrast value of the symbols for surface coarseness newly used in this specification and the symbols for the originally used old surface finish	192
Appendix M	Some technical terms involved in this specification.....	193
Appendix N	Vibration Standard for Turbo-Unit.....	194
Appendix O	National Standard, Ministry Standard and Regulation in Effect.....	194
Appendix P	Explanation for words used in the specification.....	195
Additional Explanation.....		196

1 General Provisions

1.1 General Regulations

1.1.1. The code is applicable to erection and acceptance for homemade steam turbine sets (unit capacity: 25 - 600MW, main steam pressure (gauge pressure): 3.4 ~ 16.7MPa (35--170kdf/cm²), main steam temperature: 435--550°C) and their auxiliary devices in thermoelectric power plants. It can also be used as reference for imported models with Parameters and capacity similar to or lower/higher than above values.

1.1.2. Erection and acceptance of steam turbine sets shall be based on approved design documents as well as technical documents from their manufacturers; any modification to the equipment or above documents shall be approved in advance. Construction work related with pipelines, welded parts, thermal insulation, painting, chemical water treatment equipment, chemical cleaning devices, and thermodynamic instruments and control devices shall be carried out according to corresponding Clauses in this Code. Civil work for thermoelectric power plants shall be carried out according to related national codes for construction and acceptance as well as "Section of Construction Engineering" in this Code. In addition, civil work shall also meet relevant special requirements specified in this Code. Installation of electric equipment shall be carried out according to "Code for Installation and Acceptance of Electric Apparatus (GB)".

1.1.3. Installation work for steam turbine sets shall be carried out according to this Code and latest regulations on safety technologies, labor protection, environmental protection, and fire prevention issued by the State Council and relevant authorities (see Appendix O).

1.1.4. Construction specifications and acceptance quality criteria listed in this Code are basic requirements. Whether homemade or imported steam turbine sets shall be erected according to corresponding equipment procurement contracts, technical agreements, and final drawings from the manufacturers. If such regulations in the contracts or from manufacturers are not available or insufficient, the clauses in this Code shall be pursued.

1.2 Equipment and Materials

1.2.1. Before installation, equipment shall be kept by referring to "Regulations on Maintenance and Care of Thermal Power Equipment for Electric Infrastructure Construction" (SDJ68-84) issued by the Ministry and relevant technical documents, according to natural conditions, climatic conditions, ambient environment conditions, and storage time. Any distortion, deterioration, erosion, damage or loss shall be avoided.

1.2.2. When ordering equipment, technical documents provided by the manufacturer and those attached to the equipment shall serve as important basis for construction and quality inspection. The documents required are as follows:

- (1) Equipment delivery list and packing list;
- (2) Equipment installation, operation, maintenance instructions and technical documents;
- (3) Ex-factory certificates, inspection and test data sheets, and records of fatal deficiencies;
- (4) Equipment erection drawings and component structural drawings;
- (5) Certificates for quality of materials of major parts;
- (6) Whole set of accompanied drawings and data.

1.2.3. Besides "Safety Regulations on Installation of Heat Engines", the following clauses shall be followed in equipment handling and transportation:

- (1) Bind the slings at hoisting positions specified on crates during hoisting. Underlay shall



北京文心雕语翻译有限公司
Beijing Lancarver Translation Inc.

完整版本请在线下单

或咨询：

TEL: 400-678-1309

QQ: 19315219

Email: info@lancarver.com

<http://www.lancarver.com>

线下付款方式：

1. 对公账户：

单位名称：北京文心雕语翻译有限公司

开户行：中国工商银行北京清河镇支行

账 号：0200 1486 0900 0006 131

2. 支付宝账户：info@lancarver.com

注：付款成功后，请预留电邮，完整版本将在一个工作日内通过电子 PDF 或 Word 形式发送至您的预留邮箱，如需索取发票，下单成功后的三个工作日内安排开具并寄出，预祝合作愉快！



银联特约商户