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QUALITY REQUIREMENTS FOR GUBT TYPE
EXCESSIVE PRESSURE RECOVERY GAS
TURBINES

Army Foreign Science and Technology Center
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TRANSLATION

ENGLISH TITLE: Quality Requirements for GGBT Type Excessive Pressure Recovery Gas Turbines

FOREIGN TITLE: Турбина газовая утилизационная бескомпрессорная типа GGBT

AUTHOR: Not given

REQUESTOR: AMXST-GET,
 Mr. Turner

SOURCE: GOST 5.561-70

TRANSLATOR: ACSI, K-1950

LANGUAGE: Russian

COUNTRY: USSR

ABSTRACT:

This Soviet State Standard, Gost No. 5.561-70, prescribes the standards for the manufacturing, testing, marking and packing of gas turbines.

The turbines are tested on a test bed without a generator, when idling, and at nominal rotor rotation rate according to the program developed by the manufacturing enterprise and confirmed in the established order. After set-up of the turbine is completed, acceptance tests must be conducted at the client's enterprise with the assistance of representatives of the manufacturing enterprise.

KEY WORDS:

GAS TURBINE ENGINE
 PROTECTIVE PACKAGING
 CORROSION PROTECTION
 MANUFACTURING METHOD

TEST METHOD
 GAS TURBINE ENGINE TEST
 GOST
 ENGINEERING STANDARD

COUNTRY CODE: UR COSATI SUBJECT FIELD: 14, 21, 13, 11

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The present standard is extended to GUBT type compressorless excessive pressure recovery gas turbines, maximum power 14 MW, intended for direct drive of electrical generators with a rotor rotation rate of 3000 r/min and functioning through use of excessive blast-furnace gas pressure after gas purification.

The State Emblem of Quality has been awarded the turbines in the established order.

1. Basic Parameters

1.1. The basic parameters of the turbines must correspond with those shown in the Table.

Table.

a) Наименование основных параметров	b) Нормы		
1. Мощность, Мвт	6	8	12
2. Расход доменного газа, отве- сенный к 0°С и 760 мм рт. ст., тыс. м³/ч	240	260	300
3. Начальные параметры доменно- го газа:			
c) Давление, кгс/см²	1,6	2,0	2,3
d) Температура, °С	120	120	140
a) Наименование основных параметров	b) Нормы		
4. Давление доменного газа за турбиной, кгс/см²	0,15	0,15	0,15
5. Внутренний относительный коэффициент полезного действия	85	85	85

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Key: a. denomination of basic parameters; b. standard specifications; 1. power, MW; 2. flow rate of blast-furnace gas brought to 0° C and 760 mm/Hg, thousands of m³/h; 3. initial blast-furnace gas parameters: c. pressure, kg^r/cm²; d. temperature, °C; 4. blast-furnace gas pressure after the turbine, kgf/cm²; 5. relative internal efficiency factor, %.

Note:

1. The turbines' nominal power is assured with blast-furnace gas moisture corresponding to saturation at a temperature of 40 °C and when its gas constant is 310 J/kg·C.

2. The actual power developed by the turbine depends on the available flow rate and pressure of blast-furnace gas.

2. Technical Requirements

2.1. The turbines must be produced in accordance with the requirements of the present standard according to the sketches and technical documentation that have been confirmed in the established order.

2.2. Prolonged operation of the turbine is permissible with the following deflections of basic gas parameters from the nominal ones:

- a) when temperature of gas before the turbine is raised to 170° C;
- b) when temperature of gas before the turbine is lowered to 110° C;
- c) when blast-furnace gas pressure before the turbine is raised to 2.8 kgf/cm^2 ;
- d) when blast-furnace gas pressure after the turbine is raised to 0.2 kgf/cm^2 .

2.3. The turbine's construction must exclude penetration of blast-furnace gas into the engine room under any operating conditions.

2.4. The automatic control, protective, and signalling systems, together with the engine control system, must assure the turbine's operation without added personnel in the engine room.

2.5. Construction of the turbine's inlet and outlet gas pipes must exclude stress transfer from external gas pipes to the turbine.

2.6. The turbine's external appearance must correspond to contemporary requirements of industrial aesthetics.

2.7. Turbine equipment must be assembled under the technical guidance of the manufacturing enterprise.

2.8. The manufacturing enterprise retains the right to observe conditions of use during the turbine's entire service life.

The client is required to produce logs and other materials characterizing the turbine's operation according to the requirements of the manufacturing enterprise.

2.9. The turbines must be furnished to the client in assembled form, and the lubrication system furnished in the form of individual assemblies and components.

2.10. The inspection period during the first 3 years of the turbine's use must be no less than 12 months; during further use it must be no less than 18 months.

2.11. The turbine's service life up to a limiting state must be no less than 100000 h; that of the blade apparatus must be no less than 20000 h.

2.12. All turbines must be admitted to the technical supervision of the manufacturing enterprise. The manufacturer must guarantee that all turbines will correspond to the requirements of the present standard.

During the first 18 months after the turbine is put into use, but no more than 24 months from the day that it is delivered to the client, the manufacturing enterprise is obliged to replace or repair gratis assemblies and components of the turbine that have gone out of order on condition that rules for transport, corrosion-proofing, storage and use of the turbine as stated in the manufacturing enterprise's instructions are observed.

3. Testing Methods

3.1. Each turbine must undergo testing in the manufacturing enterprise.

The turbines are tested on a test bed without a generator, when idling, and at nominal rotor rotation rate according to the program developed by the manufacturing enterprise and confirmed in the established order.

3.2. After set-up of the turbine is completed, acceptance tests must be conducted at the client's [enterprise] with the assistance of representatives of the manufacturing enterprise.

4. Marking, Packing, Transport and Storage

4.1. To the turbine's body must be affixed

- a) the State Emblem of Quality according to GOST [All-Union State Standard] 1.9-67;
- b) a specification plate showing:
 - the trademark of the manufacturing enterprise;
 - turbine type;
 - turbine number according to the numeration system of the manufacturing enterprise;
 - year of issue;
 - number of the present standard.

4.2. Before packing the turbine must be subjected to corrosion-proofing according to GOST 1.168-69 and technical documentation confirmed in the established order.

4.3. The corrosion-proofing must remain in effect no less than 18 months from the day the equipment is delivered, provided that the turbine is kept in a dry, closed chamber with an air temperature of no less than +5°C.

4.4. Corrosion-proofed turbine components, spare parts, and special instruments must be packed and secured in a container that protects them from mechanical damage during transport and storage.