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C/2168A/DV

2018-11-27

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COUNCIL

SUBJECT

Document for NC vote: Proposal for a new project committee entitled *Binary generation systems*

This version includes a modification in the Background and the full PowerPoint presentation

BACKGROUND

The attached proposal from the Japanese NC is submitted to all IEC National Committees (NCs) in accordance with the ISO/IEC Directives Part 1, §1.10 and Annex K.

K.1 Proposal stage

Votes shall be returned within 12 weeks.

Acceptance requires:

- approval by a 2/3 majority of the National Bodies voting;
- a commitment to participate actively by at least five National Bodies that approved the new work item proposal and nominated technical experts.

ACTION

IEC National Committees are invited to vote on the establishment of the proposed new project committee, providing a statement justifying their decision, using the Council voting/commenting system **by 2019-02-15. NCs not providing a statement justifying their decision will not have their votes taken into account.**

Those NCs intending to participate actively (P-Members) in the new PC, if approved, are invited to advise accordingly using the commenting system by the same date.

Secretariat note: *For administrative purposes it is requested that National Committees use the accompanying comment form in Word format when commenting.*

Attachment

Annex: presentation



PROPOSAL FOR A NEW FIELD OF TECHNICAL ACTIVITY

PROPOSER:

Japan

DATE OF CIRCULATION:

2018-11-23

A proposal for a new field of technical activity shall be submitted to the Central Office, which will assign it a reference number and process the proposal in accordance with ISO/IEC Directives, Part 1, 1.5. Guidelines for proposing and justifying a new field of activity are given in the ISO/IEC Directives, Part 1, Annex C.

THE PROPOSAL (to be completed by the proposer):

TITLE (the title shall be described unambiguously and as concisely as possible)

Binary power generation systems (Proposed title of PC)

Performance measuring methods on medium and small size binary power generation systems (Proposed title of IS to be developed)

SCOPE (the scope shall define precisely the limits of the proposed new field of activity and shall begin with "Standardization of ..." or "Standardization in the field of ...")

Define the normalized conditions that can estimate the power generation efficiency of the binary power generation system. It includes heat source conditions (temperature, flow rate), cooling conditions (temperature, flow rate).

It will be applied less than 100 kW in capacity, using hot water created by renewable energy or wasted heat in the industrial field. As far as more in capacity concerned, it will be studied in the discussion.

PURPOSE AND JUSTIFICATION (the justification shall endeavour to assess the economic and social advantages which would result from the adoption of International Standards in the proposed new field)

Through establishing and disseminating new international standard which enable estimates of energy efficiency, the project aims at contributing to both energy-saving measures and reducing CO2 emissions in the world.

- Binary generation system is capable of generating electricity even at a low heat source, and there are various uses of existing heat sources such as hot spring water and factory wasted heat. It is characterized by its ability to generate electricity all year round and its generating cost is low. In addition, the world demand for binary generation system is also rising, and it will be expected to grow rapidly in the future.
- By standardizing the performance measuring method of binary generation system, energy conservation performance can be assessed legitimately, and it will also be reflected in energy saving measures based on actual use. The social effect of realizing high energy saving performance is expected and distribution of energy saving products will be promoted worldwide.

PROGRAMME OF WORK (list of principal questions which the proposer wishes to be included within the limits given in the proposed scope, indicating what aspects of the subject should be dealt with, e.g. terminology, test methods, dimensions and tolerances, performance requirements, technical specifications, etc.)

Test methods

PREFERRED TYPE OF DELIVERABLES

International Standard

RELEVANT EXISTING DOCUMENTS AT THE INTERNATIONAL, REGIONAL AND NATIONAL LEVELS (relevant documents to be considered: national standards or other normative documents)

None

A.1 Relation to and impact on existing work

There is no existing TC to deal with the proposed standardization and no impact on existing work.

RELEVANT COUNTRY PARTICIPATION

We are asking relevant stakeholders to give experts from US, DE, IT, ID, TH, ID, SG, MY, PH and JP.

LIAISON ORGANIZATIONS (list of organizations or external or internal bodies with which co-operation and liaison should be established)

ISO/TC192

STAKEHOLDERS

Manufacturers of binary generation systems

LEADERSHIP COMMITMENT

Japan will take the role of secretariat and nominate the following Project Leader (PL) and Secretary.

PL: Dr. Keigo Matsuda E-Mail: matsuda@yz.yamagata-u.ac.jp Country: Japan
Secretary: Mr. Hiroshi Sasaki E-Mail: hiroshi.sasaki@is-inotek.or.jp Country: Japan

OTHER COMMENTS (if any)

Unfortunately, TCs that can be studied of international standardization for binary power generation systems are not found, and we would like to establish a new Project Committee in IEC on binary power generation system as renewable energy power generation systems are covered by IEC.

We are planning to hold the first meeting in June 2019 in Tokyo. The applied capacity range of the binary power generation systems in the scope might be enlarged according to the discussion at the first meeting.

COMMENTS OF THE GENERAL SECRETARY (to be completed by the Central Office):

This proposal was circulated to SMB under the reference SMB/6524/DC and has been revised to take the comments made into account. SMB decided that this proposal for setting up a PC (Project Committee) should be circulated for formal approval by the National Committees, noting that the setting up of a PC would allow SMB to determine in two years whether further work might be needed.

International Standardization for Performance Evaluation on Binary Power Generation Systems

2018-11-16
JISC

JISC: Japanese Industrial Standards Committee

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Market and Demand

Number of installed units per unit size (2016)

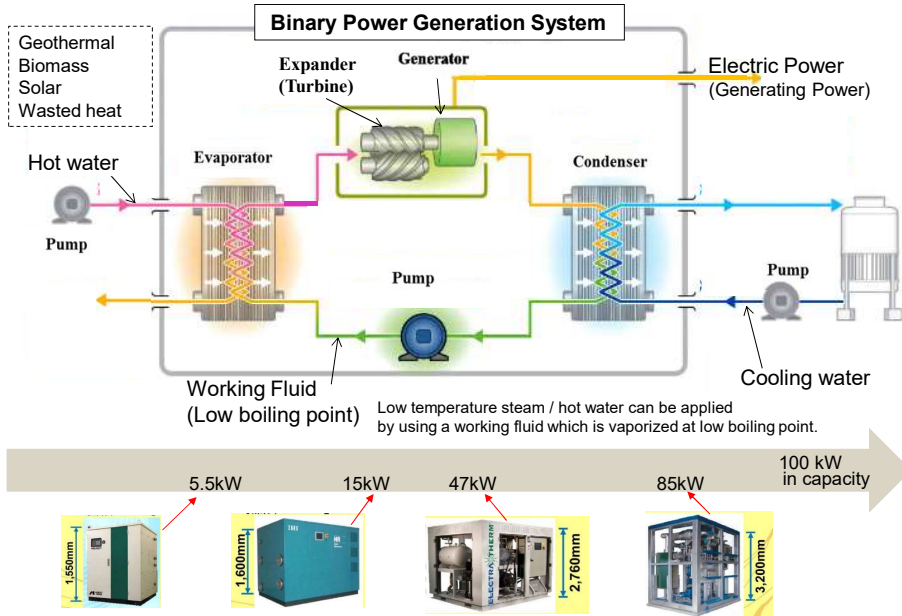
Total Installed plants : 1754

Evolution of installed capacity over time, per application

1. The world demand for binary power generation systems is increasing.
2. International Standard for legitimated performance evaluation is necessary for fair international trade.

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Binary Power Generation Systems



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The Proposal

This International Standard specifies the performance measuring method on medium and small Binary Power Generation Systems.

TCs	Name	Remarks
TC 2	Rotating machinery	Chair judged as out of scope.
TC 5	Steam turbines	Scope limits for large size turbine only.
TC 117	Solar thermal electric plants	Binary generation is NOT limited for solar plants.

- Unfortunately, TC that can address binary power generation systems is not found at present.

- **We would like to propose to establish a new Project Committee in IEC on binary power generation system as renewable energy power generation systems are covered by IEC.**

(TC 4: Hydraulic turbines, TC 82: Solar photovoltaic energy systems, TC 88: Wind energy generation systems, TC 114: Marine energy, TC 117: Solar thermal electric plants)

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Scope

- This International Standard specifies the performance measuring method for determining the capacity and efficiency ratings of binary power generation system.
- It includes heat source conditions (temperature, flow rate), cooling conditions (temperature, flow rate).
- It will be applied less than 100 kW in capacity, using hot water created by renewable energy or wasted heat in the industrial field. As far as more in capacity concerned, it will be studied in the discussion.

Remarks;

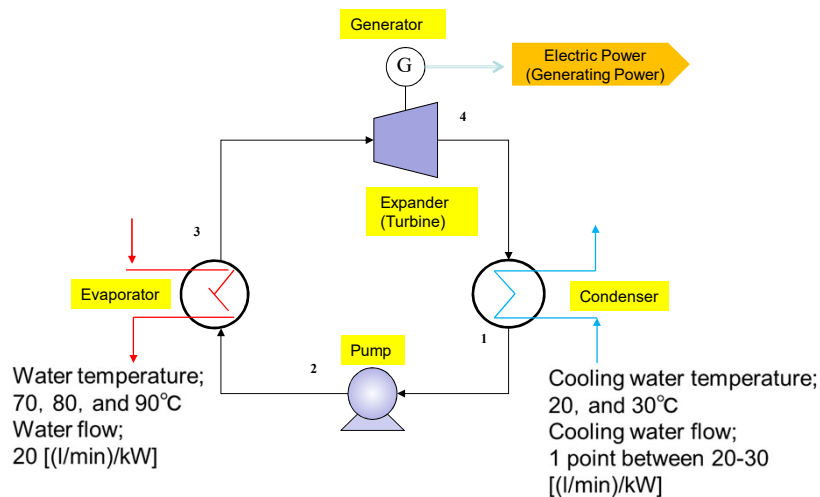
It will be also expected that this system can be applicable to other generation systems such as geothermal and/or heat plants.

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New Proposal

Performance Measuring Method on Binary Power Generation System

The generating power shall be measured below conditions.



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Simplified Calculation of Electric Power Efficiency (Temporary Example)

Appendix

Package generator electricity of binary generation system output terminal
(deducted by pump electricity consumption etc. in the package)

Heat energy quantity of used hot water

Calculation example

80°C hot water, 75 ton/h is 70°C at the output of binary generator, the heat energy quantity is as follow;

$$(80 - 70) \times 75,000 \text{ kg/h} = 750,000 \text{ cal}\cdot\text{kg/h}$$

$$750,000 \text{ cal}\cdot\text{kg/h} \times 4.2 \times 10^3 = 3,150 \times 10^6 \text{ J/h}$$

$$= 3,150 \times 10^6 / 3,600 \text{ J/sec}$$

$$= 875,000 \text{ W}$$

$$= 875 \text{ kW}$$

60 kW at output terminal for sending

$$\text{generating efficiency} = 60 / 875 \times 100 \\ = 6.9 \%$$

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Thank you very much
for your attention.