



Ministry of Energy of the Russian Federation
Ministry of Education and Science of the Russian Federation
Ivanovo State Power Engineering University (ISPEU)
Open joint stock company "System Operator of United Power System" (SO UPS)
"Russian National Committee of International Council on Large Electric Systems" (CIGRE RNC)
Charitable foundation «Reliable Rising Generation» JSC "Schneider Electric"



ELECTRICAL POWER ENGINEERING-2014
INTERNATIONAL STUDENT COMPETITION
ON ELECTRICAL POWER ENGINEERING, IVANOVO, RUSSIA, NOVEMBER
18-22, 2014



INTERNATIONAL STUDENT COMPETITION ON ELECTRICAL POWER ENGINEERING November 18-22 2014, Ivanovo, Russia

SECOND PUBLIC INFORMATION NOTICE

Ivanovo State Power Engineering University (ISPEU) and Charitable foundation «Reliable Rising Generation» in accordance with the plan of joint arrangements for the year of 2014 with the support of Joint-stock Company "System Operator of the United Power System", JSC "Territorial Generating Company #2", JSC "Schneider Electric" Russian National Committee of International Council on Large Electric Systems (CIGRE RNC), JSC «Inter RAO - Electric Power Plants» and Streamer, Electric Company Inc. hold the **International Student Competition on Electrical Power Engineering** among the students of electrical and electrical power engineering programs of study.

The aim

Improving the quality of students' preparation of Electrical and Electrical Power Engineering programs of study, increasing students' interest for their profession, finding out talented young people and forming candidates pool to organize research, project and administrative production activity.

The Competition is hold in ISPEU since 2011. The teams from leading higher educational institutions of Russia, Belarus, Kazakhstan, Germany and France declared their participation in the competition, the expected number of participants exceeds 100 students.

The following teams participate in the Competition:

1. **Almaty University of Power Engineering and Telecommunication (Republic of Kazakhstan)**
2. **Belarusian National Technical University (Republic of Belarus)**
3. **Vologda State University**
4. **Ivanovo State Power Engineering University**
5. **Irkutsk State Technical University**
6. **Kazan State Power Engineering University**
7. **National Research University "Moscow Power Engineering Institute"**
8. **Nizhny Novgorod State Technical University**
9. **Saint-Petersburg State Polytechnical University**
10. **Novosibirsk State Technical University**
11. **The Branch of National Research University "Moscow Power Engineering Institute" in Smolensk**
12. **North Caucasus Federal University**
13. **Samara State Technical University**
14. **National Research Tomsk Polytechnic University**
15. **Ulyanovsk State Technical University**

16. Ural Federal University
17. National Research South-Ural State University
18. Technische Universität Darmstadt (Technical University of Darmstadt, Germany)
19. Technische Universität Braunschweig (Technical University of Braunschweig, Germany)
20. École supérieure d'électricité – Supélec (Higher School of electricity - Supelec, France)

The place of the Competition

Ivanovo State Power Engineering University (ISPEU)
Address: 34, Rabfakovskaya street, Ivanovo, Russia. 153003

The Competition is held in lecture rooms **B-316 и B-318** of the main ISPU building (Building B). The leader is the member of the jury of the Competition. The participants requires no special technical literature for solving all the necessary reference data is included in the task.

The Competition scenario

Time	Action item	The place
November 18, Tuesday		
0:00 AM – 12:00 PM	Arrival and accommodation of the Competition participants. Accommodation in hotel "Ivanovo". Website http://www.hotel-ivanovo.ru/	Railway station, the hotel "Ivanovo"
2:30 PM – 5:00 PM	Sightseeing tour of ISPEU. Gathering at 2:15 PM in "Ivanovo" hotel holl	"Ivanovo" hotel holl
November 19, Wednesday		
8:00 AM – 8:30 AM	Transfer of the participants from the hotel to ISPEU by bus. Gathering at 7:50 AM in "Ivanovo" hotel holl	"Ivanovo" hotel
8:45 AM – 9:15 AM	Photographing of the Competition participants	Assembly Hall, Bldg. B
9:20 AM – 9:45 AM	The Competition opening ceremony	Assembly Hall, Bldg. B
10:00 AM – 2:00 PM	The Competition holding	B-316, B-318
2:00 PM – 3:00 PM	Lunch	
3:30 PM – 6:00 PM	Sightseeing tour in the city of Ivanovo. Gathering of participants in the Building B hall at 3:15 PM	
6:30 PM – 8:00 PM	Dinner	
8:15 PM – 8:30 PM	Transfer of the participants from ISPEU to the hotel	
November 20, Thursday		
8:00 AM – 2:00 PM	Excursion program for the participants of the Competition	
2:00 PM – 4:00 PM	Summarizing. Rewarding the Competition teams Photographing.*	Building B, 240
November 21, Friday		
8:00 AM – 1:00 PM	Transfer of the participants from the hotel to Moscow	
1:00 PM – 2:00 PM	Accommodation in hotel in Moscow **	

3:00 PM – 6:00 PM	Energy facility excursion	
November 22, Saturday		
8:00 AM – 9:00 AM	Registration of the participants of the Youth Day 2014 ENES 2014. Welcome coffee break.	
9:00 AM – 1:30 PM	Participation in ENES 2014 events	
1:30 PM – 3:00 PM	Meeting with the Minister of Energy of the Russian Federation A. Nowak. Award ceremony of the Competition winners in the individual championship	

* During the Competition will take place a round table with the representatives of the electricity industry. During the round table **the students will learn about employment opportunities at the branches of JSC "SO UPS" and other companies** and gain practical training in them.

** Free accommodation is planned in a hotel in Moscow from 21 to 22 November, 2014.

Tasks subjects

Tasks subjects are given in Appendix 1.

Useful information

- Business trip permits should be handed over while team registration. Filled business trip permits can be received on November 20 at the round table (Responsible person: Tatiana Vinokurova)
- Each participant must have a passport, student's card, calculator, pen. Participants are not permitted to use portable electronics during the Competition.
- Outer clothing can be checked in to the checkroom in Building B, located on the ground floor of Building B.
- Further information about the Competition - <http://ispu.ru/node/13034>
- To visit the exhibition ENES 2014 it is necessary to register - <https://reg.enes-expo.ru/reg/>

THE ORGANIZATIONAL COMMITTEE

Vladimir Tutikov,

the chairman of organizational committee of the Competition, the vice-rector of ISPEU.

Andrey Gofman,

the vice-chairman, the leader of the organizational committee of Youth Section of CIGRE Russian National Committee

Arkady Makarov,

Head of the Students' scientific research and talented students department of Ivanovo State Power Engineering University,

Coordinator of RNC CIGRE Youth Section

Ph. (4932) 269-945, +7-920-671-45-37, e-mail: nirs@ispu.ru

Timophey Shadrikov, coordinator of the Competition,

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34, Rabfakovskaya street, Ivanovo, Russia. 153003

HIGH-VOLTAGE ENGINEERING

1. High voltage power equipment electrical insulation, electrical and thermal design of this equipment;
2. High-voltage transmission line and substation equipment engineering factors calculation (clearance choice);
3. Grids overvoltage calculation and line and substation equipment influence on transients during overvoltage.

ELECTRICAL POWER SYSTEMS AND GRIDS

1. Non-continuous electrical power network steady mode calculation:
 - 1.1. Operating conditions determination (power flow, voltage);
 - 1.2. Voltage vector diagram;
 - 1.3. Voltage regulation by means of transformer ratio variation;
 - 1.4. Line and transformer losses determination;
 - 1.5. Line and transformer electric loss determination.
2. Ring mains steady mode calculation:
 - 2.1. Ring mains power flow calculation;
 - 2.2. Consumption point of power determination;
 - 2.3. Ring mains line section proof by heating.

RELAY PROTECTION AND ELECTRIC SYSTEM AUTOMATION

1. Stepped-curve time protection of single side power supply lines and transformers;
2. Overcurrent protection with definite and reverse characteristic time curve;
3. Double way feed line directional current protection;
4. Double way feed line distance protection;
5. Primary current phasor diagrams in fault location, secondary current phasor diagrams in current transformers and relays;
6. Restrained differential current protection of transformers;
7. Line automatic reclosure;
8. Transformer reserve switching device.

ELECTRIC POWER STATIONS

1. Electric power station auxiliary system circuit breaker check;
2. Ground-fault neutralizer choice;
3. Multipole bus bar choice;
4. Power station generators modes acceptability determination with power diagram usage;
5. Transformer insulation heat aging determination.

POWER SUPPLY

1. Power-supply system elements design load determination;
2. The choice of number and capacity of 6 (10) / 0.4 kV shop transformers;
3. Cable core section choice and checkup in power-supply schemes of the rated voltage 6 – 10 kV;
4. Reactive power compensation in manufacturing plant power-supply systems. Capacitor banks and synchronous motors characteristics.

ELECTRICAL ENGINEERING THEORETICAL FOUNDATIONS

1. Direct current circuits;
2. Alternative current circuits including nonsinusoidal current;
3. Three-phase circuits;
4. Transients in linear electric circuits of the first and second order except themes connected with incorrect initial conditions and Duhamel integral.



