



Russian National Committee of the International Council on Large Electric Systems (RNC CIGRE)

Proposal to hold a Colloquium of B5 CIGRE Committee in 2017



**Prof. Goda Nudelman, chairman of JSC «VNIIR», RNC CIGRE presidium member,
CIGRE SC B5 Regular Member (2014-2018)**

Dear colleagues!

I`am glad to inform you about RNC CIGRE proposal to organize the Colloquium of CIGRE Study Committee B5 «Protection and Automation» in 2017 in Russia coinciding in time with the VIth International scientific and technical conference «Actual trends in development of power system protection and automation» in St.Petersburg.

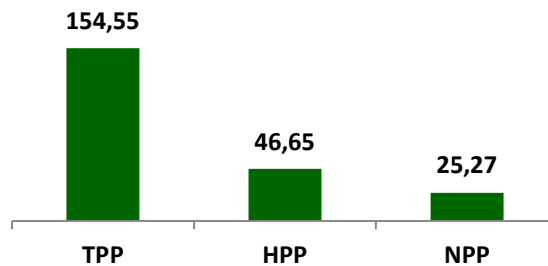
***Boris I. Ayuev, D.Sc.
Chairman of RNC CIGRE
Chairman of JSC «SO UPS»***

United power system (UPS) of Russia combines about 700 power plants with capacity of 5 MW and above and more than 10,700 lines of 110-1150 kV class, which total length is over 500 thousand. km

■ Total capacity of power plants the UPS of Russia for 01.01.2014 – 226,5 GW

■ Electric power output by the UPS of Russia power plants in 2013 – more than 1000 bln. kWh

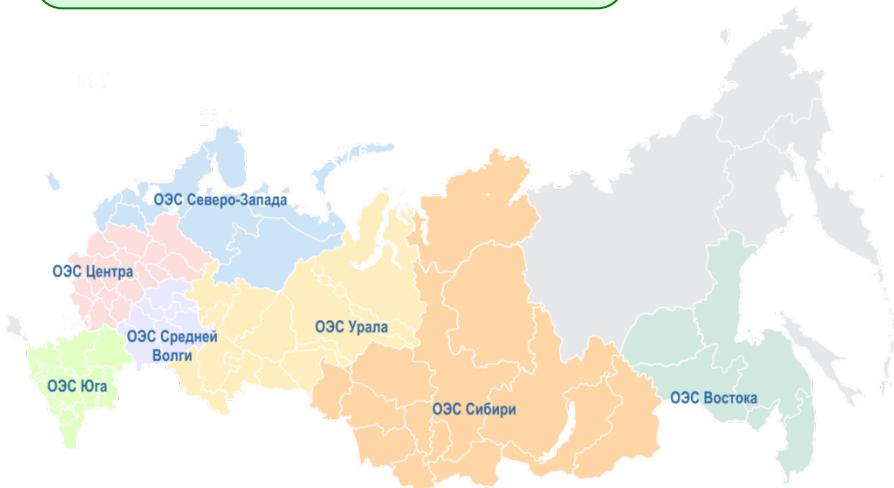
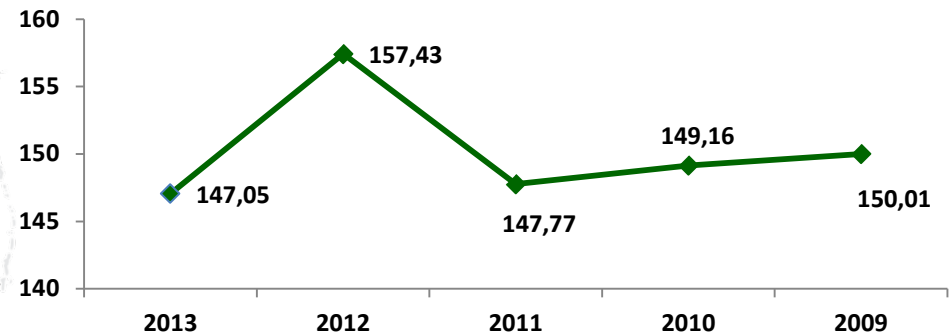
Total capacity as of 01.01.2014, GW



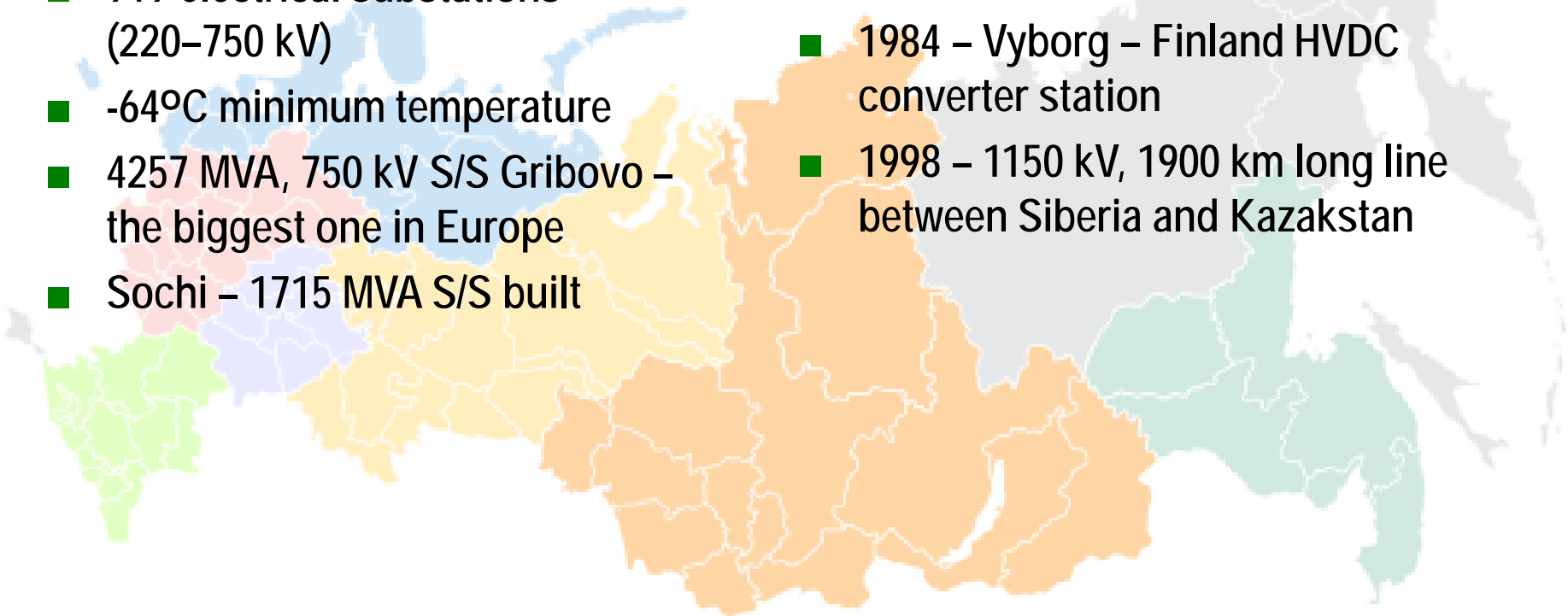
Total capacity structure, %



Dynamics of power annual maximum demand in RAO UES of Russia, GW



- 9 time zones
- 134164 km of EHV lines (length of the biggest one is 732 km)
- 919 electrical substations (220–750 kV)
- -64°C minimum temperature
- 4257 MVA, 750 kV S/S Gribovo – the biggest one in Europe
- Sochi – 1715 MVA S/S built
- 1950 – the first 200 kV HVDC cable in Moscow
- 1965 – 500 km HVDC line, on ± 400 kV basis
- 1984 – Vyborg – Finland HVDC converter station
- 1998 – 1150 kV, 1900 km long line between Siberia and Kazakstan



- Large diurnal cross-flow of electric energy due to the territorial extent of the power system.
- «Special» modes of power systems operation as a result of significant share of cogeneration.
- Long-distance HV and UHV networks. The UPS of Russia is the first in the world to build an overhead line of 1150 kV.
- It is planned to launch into operation a power transmission line and high voltage direct current links ± 750 kV.
- Severe climatic conditions for power equipment operation.



Surgut state district power station
(GRES-2)



Substation 500 kV Tratchukovskaya

Those aspects impose special requirements to ensure reliable operation of the United power system and management its operation modes, including the wide implementation of relay protection, network automation, emergency and performance control systems.

Energy strategy of Russia for the period of up to 2030 foresees:

- **Development of new generation smart transmission and distribution systems in the UPS of Russia (Smart Grids).**
- **Creation of HVDC and UHV AC transit «Siberia - Urals - European part of Russia».**
- **Using low-temperature superconducting inductive accumulators of electricity.**
- **Wide implementation of distributed generation.**
- **Development of FACTS technologies in Russia.**
- **Development and implementation of centralized emergency control systems (Special Protection Schemes), covering all levels of the UPS of Russia.**

- «Fundamental principles of smart grid concept with active- adaptive network» have been published.
- Test field center «Digital substation» was established using equipment of own and foreign manufacturers.
- Number of pilot digital substation projects will be implemented.
- WAMS is developed and some WAMPAC applications is tested.

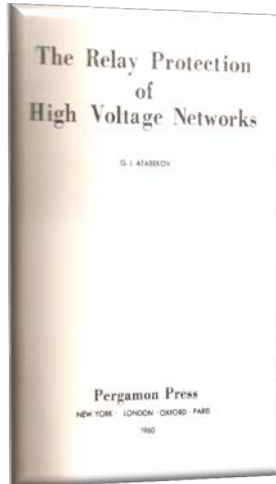


- **Russia takes part in CIGRE activities since 1923.**
- **Russian National Committee CIGRE was established and approved by CIGRE Administrative Council in 1957.**
- **Actual membership in RNC CIGRE in 2014 is:**
 - 60 collective members;
 - 217 individual members I;
 - 24 individual members II (Young engineers);
 - 285 student members (Youth division).
- **Russian activities into CIGRE:**
 - Russia is represented in the Steering Committee and the Administrative Council;
 - About 30 Russian specialists and experts are taking part in the working groups in various fields. The most interesting field of study is B5, where the Russian participants are involved in the WGs B5.24, B5.27, B5.40, B5.43-45, B5.47, B5.50-53, JWGA3.B5.C4.37.
- **Young Member Section of the RNC CIGRE (June 2012).**
- **Since 2007 in Russia every two year providing an International Scientific & Technical Conference «Actual Trends in Development of Power System Protection and Automation», organized by the RNC CIGRE in collaboration with the Study Committee of CIGRE B5, JSC «SO UPS» and the JSC «VNIIR».**

Main arrangements of the RNC CIGRE related to relay protection and controls

- Joint meeting of the Scientific and technical council of the JSC RAO «UES of Russia», the Scientific council of the Russian academy of sciences on issues of reliability and security of large power systems, Moscow.
- First International scientific and practical conference «Power system modes parameters monitoring», Moscow.
- International Scientific and Technical Conference «Actual Trends in Development of Power System Protection and Automation»: 2007 - Cheboksary, 2009 - Moscow, 2011 - St. Petersburg, 2013 - Ekaterinburg.
- VIII International Scientific and Technical Conference «Smart power. Automation and high-voltage switching equipment».
- Plenary meeting of the Scientific council of the Russian academy of science on reliability and security of large electric systems, Scientific and technical board of the Non-commercial partnership «Scientific and technical council of UPS» together with the RNC CIGRE devoted to «Generalization of global processes and technology development trends for large electric power systems (following the results of the 44th Session of CIGRE, 2012)».
- Conference «Russia and CIGRE: Joining Experience and Innovation» 25.09.2013 Kazan, State Power Engineering University.

Information support of the specialized magazine «RELEYSCHIK» (protection engineer) and leading magazine for professionals of electric grid complex – «ELECTROENERGIYA (electrical power). Transmission and Distribution» and «Transmission & Distribution World. Russian Edition».

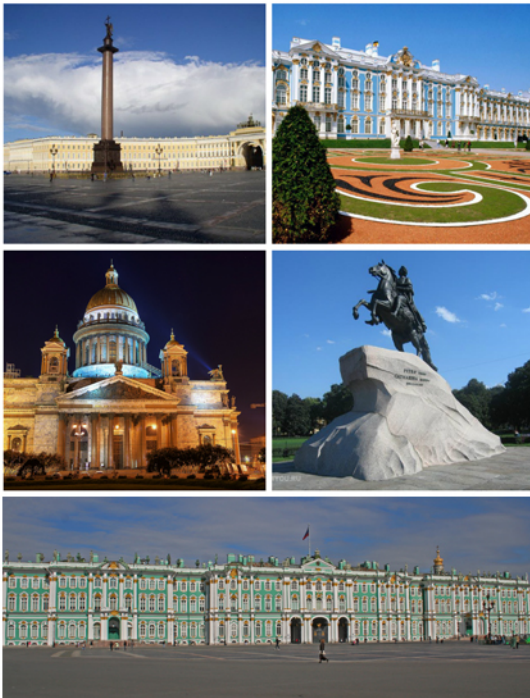


- **World-class results in theoretical research in modes of power system, relay protection and automation technologies.**
- **A large number of specialized institutes, scientific and technical centers of relay protection and automation.**
- **Several technical universities aimed to teach power engineering specialists (Moscow, St. Petersburg, Cheboksary, Novocherkassk, Ivanovo, Yekaterinburg).**
- **Original research in the field of adaptive systems and the protection and automation devices, based on the information theory of relay protection.**
- **Domestic relay protection and control devices have been developed within specific parameters of Russian UPS.**
- **Unique implementation and operation experience of SPS and automation: centralized systems of emergency control, central coordinating system of frequency and active power flows and so on.**

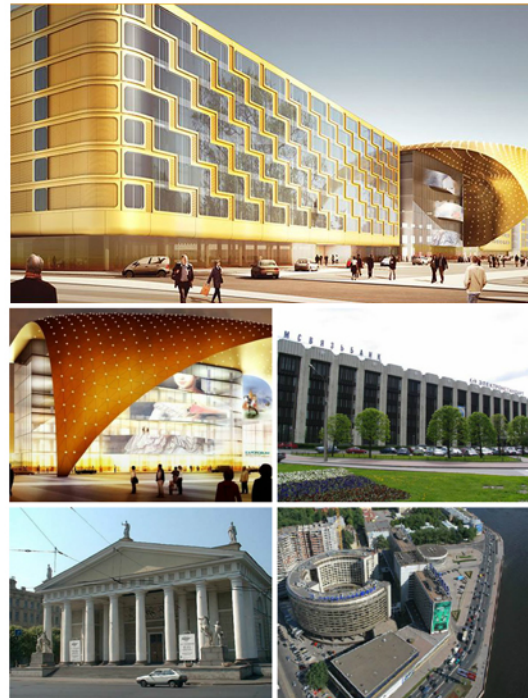


Saint - Petersburg - the second largest city in Russia located on the shore of the Gulf of Finland with more than 300-years history and rich cultural traditions

Economic and business center of the North-West region of Russia



Well-developed infrastructure for hosting international events



Suitable transport connection



International events:

- Annual Saint-Petersburg International Economic Forum
- Saint-Petersburg International Electrical Power Forum
- Annual International Scientific Conference «Saint-Petersburg and North Europe countries»
- Annual International Music Festival Greenfest
- Days of national culture of different countries of the world



Saint-Petersburg International Economic Forum



Annual international scientific conference «Saint-Petersburg and North Europe countries»

Day	Event	
Sunday		
	Colloquium	Conference
9:00 - 13:00	Work groups	
14:00 - 18:00	Work groups	Opening of exhibition, opening of Conference., plenary paper*
18:00 - 22:00		Cocktail*

Day	Event	
Tuesday		
	Colloquium	Conference
9:00 - 13:00	Special rapporteur Council of groups	Section 3*
14:00 - 18:00	Special rapporteur Council of groups	Poster Section 4*
18:00 - 22:00		Banquet*

Day	Event	
Monday		
	Colloquium	Conference
9:00 - 13:00	Work groups	Section 1*
14:00 - 18:00	Work groups	Section 2*
18:00 - 22:00	Cocktail**	

Day	Event	
Wednesday		
	Colloquium	Conference
9:00 - 13:00	Seminar**	Section 5 Close-out*
14:00 - 18:00	Topic 1**	Technical tour*
18:00 - 22:00	Banquet**	

Day	Event	
Thursday		
	Colloquium	Conference
9:00 - 13:00	Topic 2**	Training*
14:00 – 18:00	Topic 3**	Training*
18:00 – 22:00	Gala dinner**	

Day	Event	
Saturday		
	Colloquium	Conference
9:00 - 13:00	Technical tour**	
14:00 – 18:00	Technical tour**	
18:00 – 22:00		

Friday		
	Colloquium	Conference
9:00 – 13:00	Committee B5	
14:00 – 18:00	Committee B5	
18:00 – 22:00		

* - event is available for all registered members of Conference
 ** - event is available for all registered members of Colloquim

Digital to analog physical complex for testing relay protection and controls facilities and simulation of power system modes



See You in Russia!

