

## MEMORANDUM

For the period January 1<sup>st</sup>, 2011 - December 31<sup>st</sup>, 2011

Between

**JP “ELEKTROMREŽA SRBIJE”**

Kneza Miloša 11  
11000 Beograd, Republic of Serbia  
(Hereinafter referred to as “EMS”),

And

**ELECTRICITY SYSTEM OPERATOR EAD**

Gotse Delchev Blvd. No. 105  
1404 Sofija, Bulgaria  
(Hereinafter “ESO EAD”)

(Both of which are hereinafter referred to as the “Parties”)

### General Provisions

1. EMS in its role of Transmission System and Market Operator is responsible for the operation, ensuring of maintenance and development of the Serbian transmission system and its interconnections with other systems in order to guarantee the security of supply at the standard level.
2. ESO EAD is the Transmission System Operator responsible for the operation of the system and market administration, ensuring of maintenance and development of the Bulgarian transmission system and its interconnections with other systems in order to guarantee the security of supply at the standard level.
3. EMS and ESO EAD agree to apply the ENTSO-E rules and recommendations for Cross-Border power exchanges. EMS and ESO EAD observe the “Regulation (EC) No. 1228/2003 of the European Parliament and the Council as of 26 June 2003 on Conditions for Access to the Network for Cross-Border Exchanges of Electricity”, respectively the Regulation (EC) 714/2009 of the European Parliament and of the Council of 13 July 2009 as of 3 March 2011.
4. EMS and ESO EAD provide common evaluation of the transfer capacity between the power systems of Serbia and Bulgaria.

### Cross-Border Capacity Evaluation

5. The available yearly Cross Border capacity between the power systems of Serbia and Bulgaria for commercial contracting for the period January 1<sup>st</sup>, 2011 (00:00 h CET) - December 31<sup>st</sup>, 2011 (24:00 h CET) is presented in the Appendix 1. Each month represents a period from the 1<sup>st</sup> day of the month (00:00 CET) to the last day of the month (24:00 CET).

The yearly NTC values are evaluated by EMS and ESO EAD according to ENTSO-E methodologies. Both Parties have agreed the yearly guaranteed NTC values (corresponding to the

agreed coordinated maintenance plan and N-1 security criterion) for yearly allocation until November 15<sup>th</sup> of current year.

6. The monthly NTC values shall be calculated based on the actual operational conditions of the electrical power systems.

The monthly NTC values shall be evaluated by EMS and ESO EAD and agreed between Parties in written form until the 9<sup>th</sup> calendar day of the previous month and shall apply from the first calendar day of the month (00:00 h CET) till the last day of the month (24:00 h CET).

If the 9<sup>th</sup> calendar day is not a working day, then it will be the first working day following the 9<sup>th</sup> calendar day.

The following procedure for monthly NTC evaluation shall apply:

- 15 days before the deadline for monthly NTC evaluation, forecast models of Bulgarian and Serbian electrical power systems are exchanged in ENTSO-E format, including active reserves for increasing/decreasing of the generation, exchange programs and data about maintenance programs (beginning and end) for the investigated period. The forecast models are based on data for the third Wednesday of the reference month, 10:30 hours CET.
- 10 days before the deadline for monthly NTC evaluation, calculation of TTC and NTC according to ENTSO-E rules is performed. Each Party calculates the TTC values checking the n-1 criterion at least in its own power system.

4 days before the deadline for monthly NTC evaluation TTC, NTC and ATC values are exchanged by email and after discussion are harmonized. If no agreement is reached about the NTC values – the lower value shall be in force..

- The TRM value at the border is agreed to be 100 MW in both directions.

7. In case of significant changes in the network topology, which cause transmission constraints, after consultation and by mutual agreement NTC values could be changed according to the results of weekly and daily operational planning.

### Cross-Border Capacity Allocation

8. Free capacities (yearly and monthly ATC values) from Bulgaria to Serbia and from Serbia to Bulgaria, from January 1<sup>st</sup> till December 31<sup>st</sup> 2011, shall be allocated evenly half-and-half (50%/50%) for this time period by EMS under consideration of the Serbian laws and rules and by ESO EAD under consideration of the Bulgarian laws and rules.
9. In case the Parties agree on a principles and coordinate a Common Auction Procedure for allocation of the capacities on the Bulgarian – Serbian border, these Common Auction Rules shall apply for the allocation of capacities
10. EMS and ESO EAD will fully accept the result of the individual allocation procedures held by the other Party.
11. EMS reserves the right to amend/or adapt the auction rules according to the Serbian laws and rules. The actual version of Serbian Rules for capacity allocation shall be published on the website of EMS - [www.ems.rs](http://www.ems.rs)
12. ESO EAD reserves the right to amend/or adapt the auction rules according to the Bulgarian laws and rules. The actual version of Bulgarian Rules for capacity allocation shall be published on the website of ESO EAD - [www.tso.bg](http://www.tso.bg).
13. The Parties are obliged to inform each other on the:
- Allocated Cross-Border Capacity Rights on a yearly basis for the next year - not later than December 20<sup>th</sup>; of the current year.
  - Allocated Cross-Border Capacity Rights on a monthly basis - not later than 13:00 two (2) working days before the beginning of the next month;





- Allocated Cross Border Capacity Rights on a weekly basis - not later than 10:00 am on Thursday before the beginning of the next week;
- Transfer of the Cross-Border Capacity Rights between network users:
  - i. Before 13:00 p.m. on Thursday for the following Saturday, Sunday and Monday;
  - ii. Before 13:00 p.m. on Friday for the following Tuesday;
  - iii. Before 13:00 p.m. on Monday for the following Wednesday;
  - iv. Before 13:00 p.m. on Tuesday for the following Thursday;
  - v. Before 13:00 p.m. on Wednesday for the following Friday.

Such transfer is allowed on a daily basis.

In either exchanged document, as per Appendix 2, the time basis (yearly, monthly) and transfer of transmission allocation procedure shall be notified.

14. The Parties agree to inform each other about the list of registered exclusive partners (reserved capacity use respecting the principle 1:N) at latest two (2) working days prior the day of the schedule is valid for (D-2). The Interconnection Trade Responsible must be identified with published EIC codes. The list of registered exclusive Cross-Border Partners is described in the Appendix 4.

#### **Cross-Border Exchange, Scheduling and Matching**

15. The organisational procedure between EMS and ESO EAD related to the scheduling activities shall be in conformity with the ENTSO-E rules, Policy 2 "Scheduling and Accounting" of the UCTE "Operational Handbook".
16. The Parties agree on the required electronic data exchange for Cross-Border scheduling and matching described in the Appendix 3. In case of unavailability of agreed electronic way or due to other reasons, alternative communications reported in Appendix 3 could be used for exchange of the documents.
17. The Parties agree on documents and their forms used in Cross-Border scheduling and matching, as described in Appendix 3.
18. Time interval and resolution of power values in Cross-Border exchange of electricity are agreed by Parties, as described in Appendix 3.
19. Matching and confirming of Cross-Border exchange are agreed by Parties, as described in Appendix 3.
20. The Parties agree to use published EIC codes for identification of the participants, as Interconnection Trade Responsible, in Cross-Border exchanges. The Parties are obliged to inform each other on the new Interconnection Trade Responsible not later than two (2) working days before the beginning of the validity.
21. The Parties agree that Cross-Border exchange can be nominated only if the Interconnection Trade Responsible in Cross-Border exchange has a right to use Cross-Border transmission capacity.
22. The Parties agree that Cross-Border exchange can be realized only if it is confirmed by both Parties.
23. Gate Closure Time for exchange of Control Area Schedule and Cut-Off Time for final confirmation are agreed by Parties, as described in Appendix 3. If a mismatch remains at Cut-Off Time, the Parties agree to apply rules in order to get matched CAS:
  - when value in time interval is different, lower value is taken into account;
  - when there is missing counterpart, zero values are taken into account.

## Intra day Cross-Border Capacity

24. The Parties agree to apply the 'use it or lose it' principle on the capacity rights after closure of the day ahead scheduling process (at 17:00 in Day-1).
25. Intra day Cross-Border Capacity (IdATC) available for allocation will be entire non-used Cross-Border capacity remaining after day ahead scheduling process. Such capacity will be calculated for each hour and each direction, as:  
$$\text{IdATC} = \text{NTC} - \text{CAX}$$
26. Allocation of IdATC will be dealt following the 'first come first serve' non payment principle mutually.
27. Intra day capacity has to be requested by qualified Market Participant in accordance with local market rules. The capacity rights can be allocated only by mutual consent of the Parties, at least 90 minutes before its effectuation.
28. Allocated intra day capacity rights will be used by intra day schedule declarations in accordance with local market rules. Otherwise, the nomination of the Market Participant will be rejected by the Parties.

## Operation

29. The Parties agree to inform each other immediately on any disconnection of transmission-components in their own grid, provided that these disconnections have an essential impact on the grid of the other Party (in case of an unplanned disconnection promptly and in case of the planned disconnection till the fifth working day of the previous month).
30. In case of transmission constraints, the Parties agree to reduce the confirmed programs using "pro rata" method, i.e. all Cross-Border exchanges will be reduced in the same percentage, after all other available measures are applied (network topology reconfiguration, Cross-Border re-dispatching, counter-trading).

## Final Provisions

31. The contact persons and sites for exchange information on activities related to Cross-Border capacity evaluation, allocation and scheduling are attached in Appendix 5.
32. The Parties agree to inform each other on any changes of the above-agreed points in advance.
33. The provisions of this Memorandum could be amended by mutual agreement of the Parties in order to follow any changes in their respective legislation.

**For EMS:**

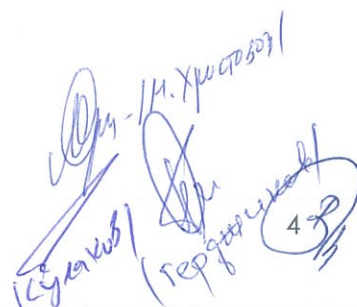


Miloš Mladenović,  
Executive Manager for System Operation and  
Market

**For ESO EAD:**



Ivan Yotov  
Executive Director





**EMS/ESO EAD MEMORANDUM**  
**For the period January 1<sup>st</sup>, 2011 - December 31<sup>st</sup>, 2011**

**Table 1 - Transfer Capacities**

	NTC [MW]
	Yearly
ESO EAD $\Rightarrow$ EMS	200
EMS $\Rightarrow$ ESO EAD	100

**The Total Transfer Capacity (TTC)** is the maximum exchange programme between two areas compatible with operational security standards applicable at each system if future network conditions, generation and load patterns were perfectly known in advance.

**The Transmission Reliability Margin (TRM)** is a security margin that copes with uncertainties on the computed TTC values arising from:

- a) Unintended deviations of physical flows during operation due to the physical functioning of load-frequency regulation
- b) Emergency exchanges between TSOs to cope with unexpected unbalanced situations in real time
- c) Inaccuracies, e. g. in data collection and measurements
- d) Uncertainties on the base case used for computation (this base case is a forecast of the power system state for a given time period in the future).

**The Net Transfer Capacity (NTC)** that is defined as:

$$NTC = TTC - TRM$$

NTC is the maximum exchange programme between two areas compatible with security standards applicable in both areas and taking into account the technical uncertainties on future network conditions.

**The Already Allocated Capacity (AAC)** that is the total amount of allocated transmission rights, whether they are capacity or exchange programmes depending on the allocation method.

**The Available Transmission Capacity (ATC)** that is the part of NTC that remains available, after each phase of the allocation procedure, for further commercial activity. ATC is given by the following equation:

$$ATC = NTC - AAC$$

APPENDIX 2

System Operation Division

**FAX MESSAGE**

Addressee:

Position:

Trade name:

Fax number:

Ref.No.:

ID.No.:

Sender:

Fax number:

Phone number:

Pages: 1

Date:

Subject: Cross-Border Capacity Rights allocated by EMS

For .....

Dear Mr. ....,

According to the MEMORANDUM between our companies please be informed that the under mentioned Cross-Border Capacities were allocated by Serbian Side and will be used for the .....2011.

Direction: Bulgaria- Serbia

Name of the company	Execute capacity	Type of allocation
---------------------	------------------	--------------------

Total: ..... (MW)

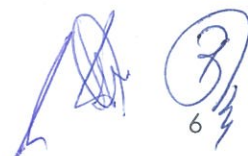
Direction: Serbia - Bulgaria

Name of the company	Execute capacity	Type of allocation
---------------------	------------------	--------------------

Total: .... (MW)

Sincerely Yours,

Name  
Director



6

**EMS/ESO EAD MEMORANDUM**  
**For the period January 1<sup>st</sup>, 2011 - December 31<sup>st</sup>, 2011**

Cross-Border Exchange, Scheduling and Matching

**a) Electronic data exchange**

All documents are exchanged through email on following addresses:

- JP EMS:

[sched\\_email@ems.rs](mailto:sched_email@ems.rs) for Scheduling System

[schedule@ems.rs](mailto:schedule@ems.rs) for backup KISS system

- ESO EAD:

[tsoplan@ndc.bg](mailto:tsoplan@ndc.bg)

- Backup for data exchange are:

- fax;

- telephone.

**b) Documents used in Cross Border scheduling process**

Parties agreed to use in Cross-Border scheduling process next Implementation Guides: „ETSO Scheduling System, ESS v2r3“, and „UCTE Implementation Guide for the ESS (ETSO Scheduling System) in the UCTE processes v1r0“. Using the new version of these documents should be allowed by both Parties.

KISS format can be used by ESO EAD till implementation of ENTSO-E documents and also as backup for the both Parties.

Parties use following documents in data exchange:

1. „Schedule Document“ - CAS – The document contains all Cross-Border exchanges between CA EMS\_AREA and CA ESO EAD. CAS covers the two types of Market Party Schedules (MPS):
  - a. Commercial schedules (Transactions between registered market Parties based on commercial traders or contracts);
  - b. TSO related schedules (Transactions towards a TSO and between TSOs to ensure a safe operation. In this context the TSOs act in some cases as Market Parties nominating commercial schedules).
2. „Acknowledgement Document“ - ACK – The document with information about acceptance of „Schedule Document“; it can be fully or partially accepted or fully rejected.

Parties use:

- xml version="1.0" and encoding="UTF-8"

- scheme:

- XSD equal as
- XSD

- The name of „xml“ file could be whatsoever name but it is advisable that the name of the file refers to file content.

- In „Schedule Document“ Parties apply following :



- „Process Type“ A01: day ahead: The complete file is always exchanged with its additional intra-day transaction.

- „Business type“: A06: external trade details without requiring Capacity contract type and Capacity Agreement identification. The Cross-Border exchange („Time Series“) is aggregated on In/Out Area - Party level.

- „Object aggregation“: A03: Cross-Border Party.

**c) Time interval and resolution (the value of power) in Cross-Border energy exchange**

Time interval in Cross-Border exchange schedule is one day which starts at 00:00 CET and ends at 24:00 CET.

The resolution is one hour or fifteen minutes with identical 4 values.

Parties use integer values in Cross-Border exchange for active power in MW; these values can be written with maximum three decimal places (in this case that is three zeros after decimal point).

Values are without + or – sign.

**d) Matching and Cross-Border schedule confirmation**

Parties agree to apply ENTSO-E matching process which recommends that CAS must be matched and in case when there is a mismatch, at Cut-Off Time, the Parties agree to apply rules in order to get matched CAS.

Matching process is successful when both Parties have identical „Time Series Header“ (except „Sender's time series identification“ and „Version“) and when the values in time intervals are identical.

In the case when there is no identical Cross-Border exchange with Identical „Time Series Header“ (except „Sender's time series identification“ and „Version“), Cross-Border exchange is considered as without „counterpart“ .

Parties agree to apply single side matching mode where the Party ESO EAD is participating and JP EMS is matching TSO.

The details about matching are described in the „UCTE Implementation Guide for the ESS (ETSO Scheduling System) in the UCTE processes v1r0“.

Parties agree to apply following documents for confirmation of CAS:

- „Intermediate Confirmation Report“ - ICNF, this document is a kind of report which EMS as matching TSO sends to ESO EAD as participating TSO. It takes into account all Cross-Border transactions, does matching and proposes solution for possible mismatch.

- „Final Confirmation Report“ - CNF, this document is final report which EMS as matching TSO sends to ESO EAD as participating TSO. It consists of matching results confirmed by both sides. It confirms Cross-Border exchange according to matching rules.

- „Acknowledgement Document“ ACK, this document gives information about acceptance of received documents, which can be fully or partially accepted or fully rejected.

If there is a mismatch at Cut-Off Time, the agreed rules shall be applied in order to get matched CAS.

In these cases, „Final Confirmation Report“ contains both the matched „Time series“ and imposed „Time series“, according to these rules.



e) **Gate-Closure Time for exchange of Control Area Schedule and Cut-Off Time**

<b>Type of data / information</b>	<b>Deadline</b>	<b>Processing, Consultation, Conclusion</b>
1/1/1. „Schedule Document“, CAS for the day concerned ,  1/1/2. „Acknowledgement Document“, ACK	(Gate-Closure Time) Previous day till 2:45 p.m. (CET)	Sending/Receiving of CAS files  Mutually checking.
1/2/1. Identified deviations between programs  1/2/2. „Intermediate Confirmation Report“, ICNF  1/2/3. „Acknowledgement Document“ on „Intermediate Confirmation Report“, ACK	Previous day till 3:15 p.m. (CET)	Identification of Market Party making mistake(s).  Creating, sending/receiving of ICNF  Creating, sending/receiving of ACK  Changing and resending of CAS.  New mutually checking.
1/3/1. „Final Confirmation Report“, CNF	(Cut-Off Time) Previous day till 3:30 p.m. (CET)	Sending/Receiving of „Final Confirmation Report“ for day concerned.
2/1/1. Intra day „Schedule Document“, CAS  2/1/2. „Acknowledgement Document“, ACK	Actual day 45 minutes before start of modified hour	Sending/Receiving of new CAS which contains old and new (modified) Time series.  Sending/receiving of ACK
2/2. Confirmation of modified program, „Final Confirmation Report“, CNF	Actual day 30 minutes before start of modified hour	Sending/Receiving confirmation of the agreed new program(s).




APPENDIX 4

System Operation  
Division

**FAX MESSAGE**

Addressee:

Position:

Trade name:

Fax number:

Ref.No.:

ID.No.:

Sender:

Fax number:

Phone number:

Pages: 1

**Date:**

**Subject:** The list of registered exclusive Cross-Border Partners

Dear Mr. ....,

According to the MEMORANDUM between our companies please be informed that the under mentioned the list of registered exclusive Cross-Border Partners will be used for the period ..... 2011.

Company responsible in, Serbia, EIC	Company responsible in Bulgaria, EIC

Sincerely Yours,

Name

Position



## APPENDIX 5

## THE LIST OF AUTHORIZED PERSONNEL

Network elements disconnection, defining of the base case exchange, creating of the network models:

ESO EAD	EMS
Mr. Nenko Gamov Tel:+359 2 92 13 728 fax. +359 2 981 01 02 e-mail: <a href="mailto:ngamov@ndc.bg">ngamov@ndc.bg</a>	Mr. Aleksandar Kurćubić Head of Planning Department Tel: +381 11 3975 771 Fax: +381 11 3970 217 E-mail: <a href="mailto:aleksandar.kurcubic@ems.rs">aleksandar.kurcubic@ems.rs</a>
	Mr. Branko Šumonja Head of Transmission Planning Group Tel: +381 11 2492 192 Fax: +381 11 3970 217 E-mail: <a href="mailto:branko.sumonja@ems.rs">branko.sumonja@ems.rs</a>

Harmonization of the NTC values:

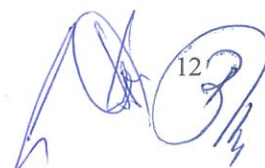
ESO EAD	EMS
Mr. Mitju Christozov Tel. +359 2 9213701 Fax. +359 2 981 01 02 E-mail: <a href="mailto:mhristozov@ndc.bg">mhristozov@ndc.bg</a>	Mr. Srđan Subotić Head Dispatcher Tel: +381 11 3970 299 Fax: +381 11 3970 217 E-mail: <a href="mailto:srdjan.subotic@ems.rs">srdjan.subotic@ems.rs</a>
Mr. Plamen Gerdgikov Tel. +395 2 981-54-15 Fax. +359 2 981 01 02 E-mail: <a href="mailto:pgerdgikov@ndc.bg">pgerdgikov@ndc.bg</a>	Mr. Aleksandar Kurćubić Head of Planning Department Tel: +381 11 3975 771 Fax: +381 11 3970 217 E-mail: <a href="mailto:aleksandar.kurcubic@ems.rs">aleksandar.kurcubic@ems.rs</a>

Exchange information on allocated Cross-Border Capacity Rights, Cross-Border schedules and the list of registered exclusive Cross-Border Partners:

ESO EAD	EMS
Mr. Mitju Christozov Tel. +359 2 9213701 Fax. +359 2 981 01 02 E-mail: <a href="mailto:mhristozov@ndc.bg">mhristozov@ndc.bg</a>	Mr. Srđan Resavac Head of Scheduling Department Tel. + 381 11 3091 130 Fax + 381 11 3970 217 E-mail: <a href="mailto:srdjan.resavac@ems.rs">srdjan.resavac@ems.rs</a>
Mr. Milen Vasilev, Mr. Yuliyen Dimitrov, Mr. Tsvetan Vazharov, Mr. Petar Aleksandrov Tel:+ 359 2 981 8617 Fax:+359 2 981 0102 e-mail: <a href="mailto:tsoplan@ndc.bg">tsoplan@ndc.bg</a>	Scheduling office Tel. + 381 11 2472 077 Fax + 381 11 3970 217 E-mail: <a href="mailto:schedule@ems.rs">schedule@ems.rs</a>
Operating (00:00 – 24.00 CET) National Dispatching Centre Tel: +359 2 981 29 22, +359 2 986 24 72 Fax: +359 2 981 49 49 E-mail: <a href="mailto:cdubg@ndc.bg">cdubg@ndc.bg</a>	Scheduling operator Tel. + 381 11 3091 850 Fax + 381 11 3971 965 E-mail: <a href="mailto:schedule@ems.rs">schedule@ems.rs</a>

## Contractual relations

ESO EAD	EMS
Mr. Mitju Christozov Tel. +359 2 9213701 Fax. +359 2 981 01 02 E-mail: <a href="mailto:mhristozov@ndc.bg">mhristozov@ndc.bg</a>	Mr. Srđan Subotić Head Dispatcher Tel: +381 11 3970 299 Fax: +381 11 3970 217 E-mail: <a href="mailto:srdjan.subotic@ems.co.yu">srdjan.subotic@ems.co.yu</a>
Mr. Plamen Gerdgikov Tel. +395 2 981-54-15 Fax. +359 2 981 01 02 E-mail: <a href="mailto:pgerdgikov@ndc.bg">pgerdgikov@ndc.bg</a>	Mr. Srđan Resavac Head of Scheduling Department Tel. + 381 11 3091 130 Fax + 381 11 3970 217 E-mail: <a href="mailto:srdjan.resavac@ems.rs">srdjan.resavac@ems.rs</a>
Mr. Stefan Sulakov Tel. +395 2 921-37-74 Fax. +359 2 981 01 02 E-mail: <a href="mailto:ssulakov@ndc.bg">ssulakov@ndc.bg</a>	

  
12