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Report of the

Black Sea Regional Transmission Planning Project Meeting

Tbilisi, Georgia

December 5-6, 2007

Georgia State Electrosystem (GSE) hosted a meeting of members of the Working Group and Steering Committee of the Black Sea Regional Transmission Planning Project in Tbilisi, Georgia from December 5-6, 2007. Participants included senior representatives of the High Voltage Network (Armenia); Armenia Energy Institute; Electricity System Operator (Bulgaria); GSE (Georgia); System Operator – Central Dispatch Administration Of The Unified Energy System Of Russia SO-CDU Of Russia; NPGC Transelectrica (Romania); Turkish Electricity Corporation (TEIAS); National Power Company Ukrenergo (Ukraine); Energy Coordination Center of Belgrade (EKC); Union for the Coordination of the Transport of Electricity (UCTE); KFW; United States Agency for International Development; and United States Energy Association.

The purpose of the meeting was to:

- Draft and Agree to a Memorandum of Understanding and Workplan for Phase II of the Project
- Exchange Information on Recent TSOS Developments in the Region
- Review Progress on the UCTE/IPS-UPS Integration Study

The meeting was chaired by Dan Preotescu of NPGC Transelectrica in his capacity as Project Coordinator.

The following agenda items were discussed:

1. Opening Remarks

Opening remarks were provided on behalf of the United States Agency for International Development (USAID) by Dana Kenney of the USAID Mission to Tbilisi and Rajiv Rastogi of the USAID Bureau for Europe and Eurasia. Dan Preotescu emphasized the accomplishments of the first phase of the project and welcomed the participants to the inaugural meeting of Phase II. William Polen of the United States Energy Association discussed the objectives of the meeting and reviewed the agenda.

2. Update Reports by the Transmission System Operators (TSOSs):

The participating TSOSs provided updates on network elements in the planning or construction phase for the period up to 2015.

a) Armenia

The Armenia Energy Institute provided an overview of Armenia's energy policy, and update on its high voltage network and discussed the results and recommendations of the KFW financed study prepared by Fichtner.

b) Bulgaria

The Electricity System Operator provided an update on the Bulgarian transmission system, including load forecasts for the periods up to 2013 and 2018. The status of the interconnection project to link Bulgaria with Greece from Maritsa East (BG) to Nir Santa (GR) was also discussed in terms of Greece's interconnection with Turkey at Babyesky and its importance to the Black Sea region. A copy of the presentation will be posted to the Black Sea Project website.

c) Georgia

GSE reported that it is discussing transit of 1,600 MW through its system from Azerbaijan to Turkey and emphasized the importance of strengthening its internal 500 kV lines to do so. Two options under consideration for strengthening the 500 kV system were presented. GSE noted that the construction of the Black Sea regional planning model has been used extensively in its discussions with Turkey and preparations for working with Azerbaijan. A copy of the written remarks will be posted to the Black Sea Project website.

d) Romania

NPGC Transelectrica provided an update on its planned network improvements for the planning period ending in 2015.

e) Russia

SO-CDU of Russia reported on planned transmission and generations additions to the northern Caucasus grid for the planning period up to 2014, which coincides with the need to strengthen the grid for the Olympic games to be conducted in Sochi that year.

f) Turkey

TEIAS provided an overview of the Turkish power system and planned network additions. TEIAS reported that a protocol on importing power from Georgia was signed by the Turkish and Georgian governments in September 2007. The protocol was supported by analysis

supported by the regional model produced in phase one of the Black Sea project. A copy of the presentation will be posted to the Black Sea Project website.

g) Ukraine

Ukraine reported on the planned upgrades to its internal network that will improve its capacity to support greater trade and exchange within the Black Sea network and with neighboring networks. This includes constructing and modernizing the existing 220 and 700 kV system, reinforcing connections between eastern and western Ukraine to enhance flows from surplus areas to deficit areas within Ukraine, and reinforcing connections with neighboring countries.

3. Report on the Results of Phase One of the Black Sea Transmission Planning Project

Predrag Mksa of the Electricity Coordination Center of Belgrade (EKC) discussed the results of Phase One of the Black Sea Transmission Planning Project in terms of the proposed workplan for phase II of the project. He discussed the technical characteristics of the model created by the Working Group and the results of its analysis.

He noted that an important task for the second phase will be to update the static model for 2010 created during the first phase. In this regard, Dan Preotescu suggested that in updating the model, the project participants should pay special attention to “switching on” in the model, only those network elements that are realistically expected to be in place in 2010-2011. This will enhance the accuracy of the model and reduce the number of potential new transmission projects identified by the Working Group from its current number of 70.

Mksa noted that the region is experiencing seasonal changes in the pattern of electricity consumption. Therefore, in addition to updating the current existing winter peak models for 2010, he suggested that the Project create a summer peak model for 2010 in the static mode. Participants concurred with this suggestion and it was discussed further in the portion of the meeting dedicated to workplan development.

Mr. Mksa then discussed the potential technical approach and requirements for developing a dynamic model for the Black Sea network based on the existing static model for 2010.

4. Report from KFW on the Caucasus Regional Network

Christian Calov and Nino Shanidze of the KFW Development Bank updated the Working Group on the status of KFW studies and projects to reinforce the high voltage transmission system in Armenia and Georgia and interconnections to Turkey. They emphasized the importance of

including Azerbaijan in the Black Sea project. A copy of the KFW presentation will be posted on the Black Sea Project website.

5. Discussion on Workplan Development

On the afternoon of December 5 and the morning of December 6, Dan Preotescu led a discussion to review and amended the workplan originally drafted by USEA and updated by him. The participants agreed that while the exact timeframe of Phase II cannot be determined at this point, Phase II is envisioned for three years. Each year will be considered a distinct “stage” of the Project.

As a result of the workplan discussions, the following focal areas were agreed to by the participants for Stage one (year one) of Phase II of the Project:

- Training for, and initial development of, a dynamic model of the transmission network based on the static model developed in phase one;
- Training on economical planning criteria and economical criteria for prioritizing regional transmission planning projects identified by the Project;
- Update of the 2010 steady state models and development of a new 2010 summer peak model in the steady state;
- Performing analyses in the steady state model concerning the efficiency of new projects both in synchronous and asynchronous operation mode; and
- Review the transmission planning criteria used in each participating country.

The participants agreed to a schedule of meetings and deliverables related to these subject areas contained in the attached draft workplan (**Attachment One**).

6. Update on the UCTE/IPS-UPS Synchronous Interconnection Study

Matthias Luther of the EON NETS and the Project Manager of the UCTE/IPS-UPS Integration Study provided an overview of UCTE and the status of the integration study. As background information on the study, Mr. Luther first presented on the evolution of UCTE, its membership, roles and responsibilities and plans for expansion.

Following the overview of UCTE, Mr. Luther provided a detailed update on the structure and status of the IPS/UPS integration study. The study is designed to answer three major questions:

- Is synchronous interconnection of the UCTE and IPS/UPS feasible?
- What are the mandatory measures and requirements necessary on both sides to accomplish synchronous interconnection?
- What are the associated costs?

The project is organized by a consortium of 11 TSOSs in the UCTE system and a separate consortium of eight TSOSs in the IPS/UPS area. The three year study has a budget of 10 million Euros and is organized in five working groups as follows:

- WG 1: Steady State Analysis
- WG 2: System Dynamics
- WG 3: Power System Controls
- WG 4: Organization and Management
- WG 5: Legal Aspects

The project commenced in April 2005 and is expected to be completed in April 2008. Preliminary findings reveal that there is:

- a need to reinforce the IPS/UPS interfaces with UCTE;
- a higher potential risk to dynamic system stability of the coupled systems than there is in the present individual synchronous systems;
- a need to adapt and harmonize the existing defense and restoration plans in both synchronous systems
- a need for interzonal, bilateral and multilateral agreements to establish the legal basis for synchronous coupling as the foundation for future reliable market platforms under the framework of EU market requirements and standards.

The preliminary results reveal that even if synchronous coupling may appear viable under the implementation of certain pre-conditions, it can only be viewed as a long term option for creating a joint electricity market platform.

A copy of the presentation on the study will be posted to the Black Sea Website.

7. Memorandum of Understanding

The participants reviewed and agreed to the wording of a Memorandum of Understanding (MOU) for Phase II of the Project. The participants agreed that the MOU will be circulated for signature following the meeting. A copy of the MOU is provided as **Attachment Two** of this report.

8. Task List

Bulgaria volunteered to host the next meeting of the Working Group in Varna in February. The participants developed a Task List and schedule for the period leading up to the meeting. The Task List is provided at **Attachment Three** of this report.