

FEASIBILITY STUDY: SYNCHRONOUS INTERCONNECTION OF THE POWER SYSTEMS OF IPS/UPS WITH UCTE

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Introduction

In January 2002 the Electric Power Council of the Commonwealth of Independent States (EPC CIS) has expressed its interest in the synchronous interconnection of the Unified Power Systems/Interconnected Power Systems¹ (IPS/UPS) with the power system of the Union for the Co-ordination of Transmission of Electricity (UCTE). UCTE is the association of 34 Transmission System Operators (TSO) from 23 countries and is responsible for system security and reliability of the transmission system on the European continent.

As a first initiative UCTE has launched a Pre-Feasibility Study based on steady state load flow investigations. After the completion of the Pre-Feasibility Study at the beginning of 2003 UCTE directing bodies decided to launch an extended feasibility study on the synchronous interconnection of the power systems of IPS/UPS with UCTE.

The Feasibility Study is considered as a joint project of UCTE and IPS/UPS, mastered by UCTE. The overall project duration will last three years while the project kick-off is planned for early 2005. The findings and recommendations of the Feasibility Study will be used as a basis for the future negotiations between UCTE and EPC CIS.

The project is in itself another milestone in the history of UCTE and IPS/UPS. A synchronous interconnection would lead to a common frequency from Lisbon to Vladivostok. It would create the world largest synchronous system spanning 13 time zones and serving approx. 700 million people from Europe to Northern and Central Asia. The geographical extension of the interconnected systems is shown in Figure 1.

More than 100 experts from the electricity industry will be involved in the work. The major constraint for the project is to maintain the present system performance with respect to security and reliability.

¹ IPS/UPS comprise the transmission systems of Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

Since the project itself is an important part in the context of the EU-Russia Energy dialogue, it is supported by the Trans European Network (TEN-Energy) Programme of the European Commission (EC).

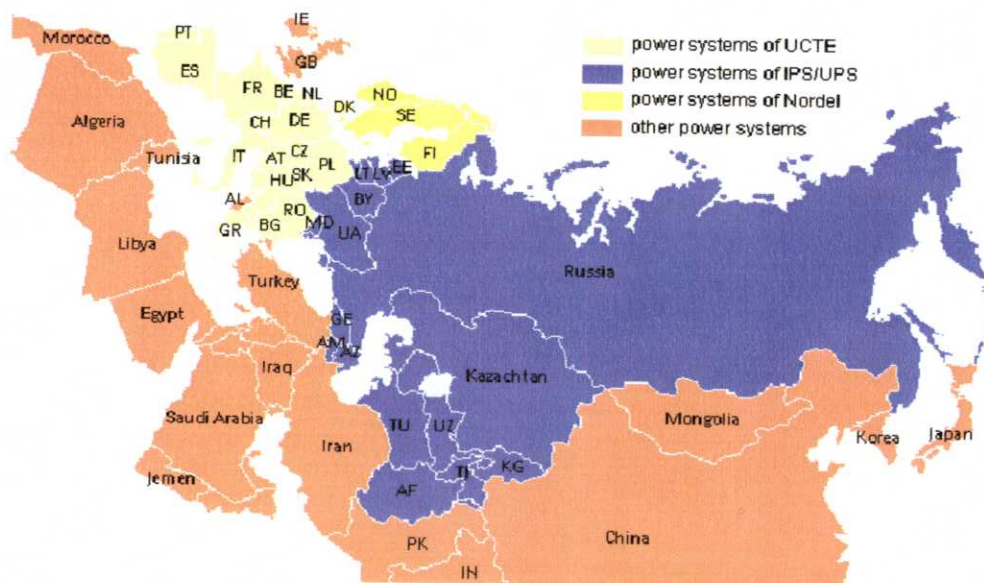


Figure 1: Power Systems around Europe

Study Objectives

The study comprises all necessary investigations to define under which conditions a synchronous interconnection of the two systems could be feasible and could be operated under stable conditions. Hereby the main objectives, beyond technical aspects, will cover operational, organizational and legal issues related to the East-West synchronous interconnection.

The three major questions to be answered by the study are:

- Is a full synchronous interconnection of IPS/UPS with UCTE feasible?
- What are the mandatory requirements on both sides?
- What are the associated costs?

One major technical challenge is to secure dynamic system stability for the interconnected systems without any reduction of the quality of supply on both sides.

Project Organisation

The study will be mastered by a UCTE-Consortium of eleven TSOs from nine countries, namely Belgium, Bulgaria, France, Germany, Hungary, Poland, Romania, Slovakia and Spain (see Figure 2). Other UCTE-TSOs support the project by data model provision.



Figure 2: The UCTE Consortium

The consortium on IPS/UPS side consists of the companies of Belenergo (Belarus), Eesti Energia (Estonia), Latvenergo (Latvia), Lietuvos Energia AB (Lithuania), Ukrenergo (Ukraine), Moldelectrica (Moldova) and System Operator - Central Dispatch Organisation of Unified Energy System of Russia.

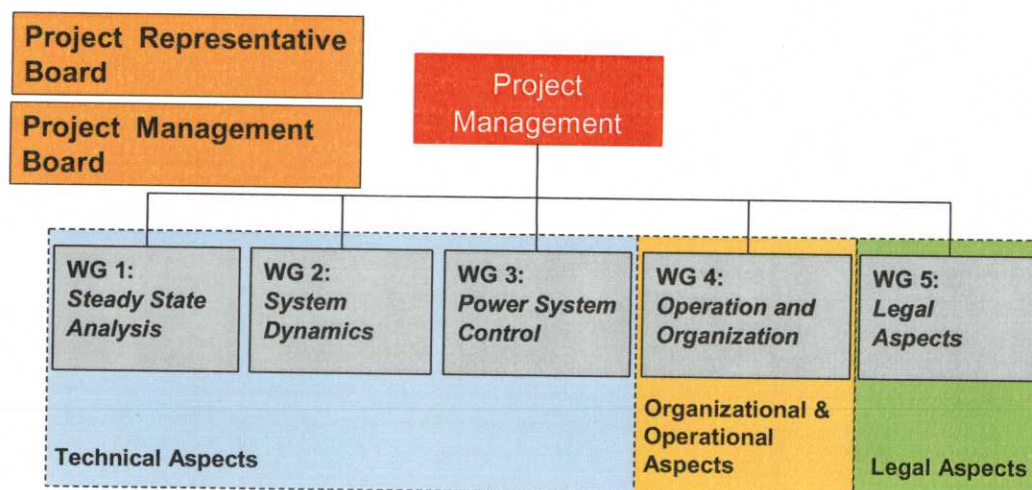


Figure 3: Project Organisation

The project structure is shown in Figure 3. On the working level five working groups (WG) deal with the subtasks of steady state analysis, system dynamics, power system control, operational and organisational issues and legal aspects. The project management is co-ordinating all internal and external project activities.

Further project entities are:

- a Project Representative Board, which accompanies the project on the political level which shall consist of representatives from the European Parliament, European Commission, UCTE, Baltic States and CIS countries
- a Project Management Board, which is responsible for steering the project and deciding of further steps as well as of approving of working group progress and reports. This joint board consists of representatives from UCTE and IPS/UPS.

Presentation Themes

The contribution to the Conference gives an overview about the activities during the pre-project phase. Additionally, the main challenges of the study and the programme of work will be summarized and the current project status will be presented.