

4

THE ATTRACTIVENESS OF
THE UCTE SYNCHRONOUS AREA

The UCTE synchronous system ranks among the biggest and most complex systems in the world, integrating the whole western and central part of the European mainland and three Maghreb countries. The expansion of this system since the first interconnection to the present status has been a success story. Today UCTE coordinates the operation and development of the electricity transmission grid from Portugal to Poland and from the Netherlands to Romania and Greece providing a reliable market platform to all participants of the Internal Electricity Market (IEM) and beyond.



Facts about current extension activities

Nevertheless, the evolution of the UCTE system never stops. Currently, UCTE faces the challenge of expansion requests towards the the following geographical directions:

- To the Southeast with the request for the synchronous interconnection of Turkey.
- Further eastward in Northern Africa which involves the interconnection of Tunisia – Libya that would bring the UCTE frequency up to Syria and Lebanon.
- And, most significantly, to the East which involves the connection of two very large systems, the one of UCTE and the one of IPS/UPS. Such interconnection would lead to a huge electrical system spreading from Lisbon to Vladivostok.

The major challenge for the aforementioned enlargements is to make them possible in a smooth and technically sound manner, as happened in the past, while maintaining the quality of the UCTE system at the present high level of safety. This will allow to provide a sound basis for electricity markets in broader Europe and their enlargement to the benefit of all market players and consumers. <<<

However, today's tasks are much more complex than in the past. In some cases, the systems requesting interconnection with the UCTE system do not share the same operational philosophy, the same rules and/or standards, and some of the systems examined for interconnection present inherent technical problems. The fact that vertically integrated utilities have been recently replaced by unbundled enterprises also adds to the complexity of the situation and makes the security and the sharing of responsibilities issues more critical than in the past. Also the countries making a request for interconnection already have interconnections further beyond, which might give rise to more requests.

The precondition for any extension of the synchronous area beyond the borders of UCTE is to keep the reliability of the system at the current high level. <<<



Current projects

1. Feasibility Study on synchronous interconnection of the Power Systems of IPS/UPS with UCTE

In January 2002, RAO UES Russia acting on behalf of EPC CIS* and Baltic States requested UCTE to study possibilities of synchronous interconnection of the European power grid – UCTE with the transmission systems of IPS-UPS**. The study with a direct support of the EC was launched in 2005 and is performed as a joint project under the responsibility of UCTE.

Presently, there is no example of a system in the world which operates in synchronous mode to this extent.

The feasibility study will give an answer to the main questions:

- Is a synchronous interconnection of IPS/UPS and UCTE possible?
- What measures (technical, operational and organizational and legal) and investments have to be taken on both sides?
- What are the associated costs?
- What would be a non-synchronous solution both from the technical and economic point of view?

The request for UCTE-IPS/UPS interconnection is quite different from all former requests for system interconnections. It implies the electrical interconnection of two large power systems with different rules and standards for each of them.

Therefore, the feasibility of the synchronous interconnection has not only to be defined in terms of compatibility of technical performance, but also of organization and management in order to ensure a secure and reliable interconnection. A mandatory set of technical requirements needs to be determined in order to avoid any negative influence of one system on the other although the technical standards and internal rules of each system will, as far as possible, remain unchanged provided they do not have any negative impact on system security.

>>>

* EPC CIS: Electric Power Council of Commonwealth of Independent States

** IPS/UPS: Comprises the Power Systems of the Baltic States (Latvia, Lithuania, and Estonia), Armenia, Azerbaijan, Belarus, Georgia, Moldova, Mongolia, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine and Uzbekistan.



2 Interconnection of the Turkish Power System to UCTE

>>> Meanwhile, important milestones have been reached. Initially, a load-flow study model of the transmission systems spanning a geographical extension from Portugal to the Bering Sea was jointly prepared by experts from both parties. The simulation model reflects a peak load case with a time horizon of 2008 and a total load of 530GW. The first simulations performed until now are solely dedicated to the steady-state load flow and do not allow to identify fundamental technical barriers to a positive assessment of the feasibility of a synchronous operation between IPS/UPS and UCTE.

The study results will be used as a basis for taking decisions on the further developments of the systems concerned. All this may result in a timeline for the possible industrial implementation of the study results. Further decisions need to be made by stakeholders taking into account further fundamental boundary conditions of the East-West cooperation in Europe in the field of electricity.

<<<

The discussions for the connection of Turkey to UCTE have started in 2000, following a relevant request to UCTE for connection and membership. The »Service Contract« for the Execution of the Studies was signed between UCTE and the EC Central Finance and Contracts Unit (CFCU) for Turkey at the end of September 2005. The work was performed by a consortium of TSOs, members of UCTE with the support of TEIAS, the Transmission System Operator in Turkey. Financing was provided mainly (90%) by CFCU with a 10% contribution from UCTE own funds.

The latest scenario considered will enable the connection of Turkey to the UCTE grid via three single-circuit 400kV lines (two 400kV lines between Turkey and Bulgaria and one 400kV line between Turkey and Greece). The planned 400kV 3-circuit connection and the configuration of 400–220kV systems in the Balkan countries and Hungary will ensure a reliable interconnection with Central Europe, which is adequate to the capacity of the Turkish power system. The interconnection of Turkey with the UCTE grid is also a pre-requisite for the feasibility of the prospective Mediterranean Synchronous Ring. However, given the UCTE technical requirement, the synchronization of the Turkish power system with its Eastern and South-Eastern neighbours needs further substantial efforts.

<<<



3. Interconnection of Tunisia – Libya and LEJSL System with UCTE

Morocco, Algeria and Tunisia are already synchronously interconnected with UCTE via two 400 kV AC submarine cables to Spain. Said countries though synchronously operating with UCTE are not members of the Union, therefore they do not share the same technical operating rules and the same obligations.

At the request of Tunisia and Libya, UCTE investigates whether an extension of the European frequency does not endanger the reliable operation within UCTE. A possible future closure of the Tunisia – Libya interconnection originates from previous studies carried out with the Spanish UCTE member REE.

The expansion would involve the closure of two existing 225 kV lines between Tunisia and Libya which, in case of success, would extend the synchronism from Spain to Syria involving in addition Libya, Egypt, Jordan and Lebanon.

The conclusion of the investigations so far is that the system needs the following substantial improvements before being connected to UCTE:

- Power System Stabilisers in Egypt
- defence plans to be adapted

Based on the conclusions of the study, UCTE asked for:

- the assessment on all the conclusions and recommendations by all countries
- a description of measures executed against stability problems
- a description of measures executed regarding defence plans

<<<



4. Interconnection of Ukraine and Moldova with the Electrical System of UCTE

On March 2006, an official request of Ukrenergo/UA and Moldelectrica/MD was submitted to UCTE via Transelectrica (as »Supporting Party«) for synchronous interconnection with the UCTE grid. Both systems requested to be considered as a single control area.

On 26 June 2006, the UCTE Steering Committee recognized the case as »Type B extension« according to the UCTE Internal Regulations Art.32 (»each synchronous interconnection between a Control Area which is part of the Synchronous Area and a Control Area which is not yet part of the Synchronous Area«). Further to the request on 23 November 2006, the Ukraine/Moldova Project Group was launched.

This new request is different from the IPS/UPS study since Ukraine and Moldova together with the connection request are seeking also full integration and membership with UCTE after achieving full compliance with the provisions of the UCTE Operation Handbook. UCTE has decided to treat the two projects, namely Ukraine/Moldova and IPS/UPS, separately and independently.

<<<

5. Integration of Albania

The Albanian power system has been already connected and operated synchronously with the UCTE network in the late 80ies.

As a result of the reconnection of two UCTE zones, the question of compliance with operational rules has become a matter of priority. The issue of compliance with operational rules was investigated and discussed with the Albanian Power System Operator ATSO which has expressed its strong commitment to proceed to the necessary system upgrade in order to comply in due time with UCTE standards. It was decided that:

- the Albanian System is to remain interconnected with the UCTE power system
- ATSO has to organize the Load-Frequency Control function forming its own control block under the coordination of the »UCTE Co-ordination Centre South« run by swissgrid in Laufenburg.
- UCTE appoints an »Albania« Project Group charged to give to Albania the necessary information on how to proceed in the improvement process and how to perform the monitoring of the entire process.

The UCTE »Albania« Project Group has already prepared the »Albanian System Status Report« that reflects the status of the Albanian System at the end of 2005 and the system development plans. Moreover, the PG »Albania« has started the preparation of the catalogue of measures needed for the Albanian System to comply with the UCTE Operational Handbook.

<<<