

3

4

5

6

7

8

## SYSTEM ADEQUACY OF THE UCTE SYSTEM »TESTED« DURING THE SUMMER 2003

The dramatic events of the year 2003 have highlighted the relevance of the work performed by the UCTE »System Adequacy« Sub-Group providing early warning signals regarding system reliability. The statistical experts of UCTE have also started some new investigations aiming at fine-tuning their indices and criteria to even better analyze and evaluate system adequacy in the future.

Even if a blackout such as the one experienced in Italy which actually happened around 3:00 in the morning, a time where load is usually quite moderate, cannot be anticipated through that kind of report, UCTE had already warned that the general balance situation is getting tighter in some regions. The »UCTE system adequacy forecast 2003–2005« stressed the low level of remaining capacity and a nearly constantly tight situation for instance in the Italian system. This worrying situation was also mentioned in the UCTE press release of 30.01.2003, Italy being one of the countries where the level of 5% of remaining capacity was not met.

The forecast report issued last year pointed out the increasing risk concerning the Italian system in the following terms:

*»When considering the remaining capacity as a percentage of the generating capacity, the Italian peninsula will evolve from a critical situation in 2003 to a more critical one in 2004–2005«.*

Methodological improvements have been realized in 2003 in order to provide a more complete and comprehensive information and to respond to the growing awareness of the importance of the power system reliability issues.

Since 2002, the retrospective System Adequacy reports have included in one single paper a generation adequacy assessment and an overview of the situation and main changes in the UCTE transmission grids.

&gt;&gt;&gt;



## Main trends of the year 2002

### *Generation Adequacy*

In general, electricity supply remained at a high level of reliability in 2002.

This is attributable to the moderate increase in consumption (+0.6% / +12 TWh) resulting from the global economic situation and from more favorable meteorological conditions compared to the previous year, while the generating capacity increased by 1.7%.

The UCTE remaining capacity reached its minimum, though sufficient levels in January and in June (9.7% and 9.0% of the generating capacity, respectively), periods where the prices on the European Power Exchanges reached their highest values. That highlights the likely link existing between the UCTE remaining capacity index and the prices observed on the European Power Exchanges.

Commissioning of new power plants has significantly improved the power balance in Spain, where a difficult situation was observed last year, and in Greece, whose potential difficulties were highlighted in the System Adequacy Forecast report.

Production of hydroelectric plants showed a very significant decrease of 59 TWh (i.e. -18%), essentially due to the exceptionally dry hydro conditions in continental Europe at the beginning of 2002.

The internal exchanges inside UCTE were stable as compared to the previous year (at around 260 TWh), that represents 12% of the consumption.

### *Transmission System Adequacy*

The interconnected UCTE network seems to be more and more loaded, especially the cross-border lines.

The physical flows due to commercial transactions between parties located in different countries («the internal electricity market») create some permanent or occasional congestions. Difficult situations resulting from unexpected loop flows were observed in Belgium, Italy, Switzerland and Austria.

New lines were commissioned with a direct impact on the constraints affecting the interconnections or on the transmission capacity and congestion management. The main improvements concern the interconnections between France and Germany, France and Spain, Germany and the Netherlands, Spain and Portugal.

Some countries were affected by severe storms and rainy periods, which caused damages and loss of load in Belgium, the Netherlands, Greece, Austria and the Czech Republic. <<<



## System Adequacy Forecast 2004 – 2010

### *Generation adequacy assessment*

The reliability of the UCTE System as a whole is likely to remain at an acceptable level over the 2004–2006 period, due to both the expected new generating capacity and some developments of national and international transmission grids.

According to the information available to the TSOs, a sensible decrease in remaining capacity is expected between 2008 and 2010. There is a potential deficit in generation unless additional firm investment decisions are taken soon. The CENTREL block seems to be the only one in a position to remain a structural exporter. But future environmental legislation could affect this position.

The UCTE main block, which represents a major part of the installed capacity and has been exporting until now towards the surrounding areas, will face until 2010 a decrease in the remaining capacity below the indicative adequacy margin. In 2010 this block could become a net importer in situations where the temperature drops 5°C below normal.

The reliability of the Iberian and Italian blocks is expected to improve thanks to strong programs leading to the commissioning of many GW of new generating plants. The ability of these countries to effectively reach these goals has to be monitored in the next system adequacy forecasts.

Serbia and Montenegro, FYROM and Greece are in a weak position concerning generation adequacy; the reconnection of the second UCTE zone expected for mid-2004 will be of utmost importance for the reliability of this region. This reconnection will also play an important role for Romania and Bulgaria whose margins are decreasing all along the period.

It is also important to note the increasing role of renewable energy sources, mainly wind power, in the generation mix of the UCTE system. This development is liable to create some new problems concerning the availability of sufficient balancing power especially since important decommissioning of conventional thermal plants is expected during this decade and in the next. This important role of wind power is also liable to generate large short-term variations of flows across the international transmission system. It can also be observed that in the countries where the share of wind power is already high (Spain and Germany), significant development of the 400kV transmission network is necessary.

### *Transmission system adequacy*

The projects concerning the development of the international interconnections should help to improve the reliability of the surrounding blocks and of deficit areas.

Nevertheless, the number of projects is limited, which reflects the difficulties encountered by the TSOs to get these projects accepted by the public. <<<

>>> The »System adequacy forecast 2004 – 2010« provided for the first time in the history of UCTE forecast data up to seven years ahead.

It is a matter of fact that the longer the time horizon, the higher the uncertainties. Because the aim of such long-term forecasts is to highlight opportunities or show the necessity to invest in generation, UCTE decided to include only future generation capacities whose construction and commissioning are considered to be firm by the TSOs. On the other hand, the installed capacity can also be overestimated in those forecasts, since decisions concerning decommissioning of generating units are notified to TSOs at very short notice and are therefore not taken into account in UCTE forecasts.

Under these assumptions, the main conclusions of the exercise are that even if the security of supply should stay at an acceptable level for the short term, it cannot be excluded that unfavourable conditions such as a cold wave combined with plant outages above normal could lead to shortages in some parts of the system.

This kind of risk will increase in the medium term unless firm investment decisions are taken soon.

Of course the blackout in Italy was not a direct consequence of the low level of remaining capacity. Reliability of each power system is more complex and depends also on the operating rules followed by TSOs, market rules, weather conditions and many other factors. However, a tight situation concerning reserves in the system, usually combined with price differences between countries, encourages and stimulates market actors to rely more and more on energy imports from other power systems. This can lead to congestion on borders and erode reliability of the system. UCTE system adequacy forecasts can indicate negative trends in power systems and provide warning signals.

Some other important statistical publications of UCTE are the Monthly Statistics, which aim at giving rapidly a quick and complete overview of the UCTE system to market actors and authorities, and the Statistical Yearbook, published once a year with some consolidated values. The Yearbook is a unique source of information on UCTE transmission systems, production and consumption of electricity, loads, energy flows and other aspects of interconnected system operation.

<<<

