core∫σ

Coreso Operational Review 2011

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Coreso key figures for 2011

Coreso performance

End of 2010 two new shareholders, 50Hertz and Terna, joined Coreso. Studies for them started from July 2011. All Coreso key figures are taking them into account.

MAIN PERFORMANCE FIGURES

Publication of 24 merged timestamps	364/365 days
Number of SMART* performed	44
Number of BALIT variants performed in day-ahead	6
Number of other variants performed in day-ahead	74



Number of in Depth Security Analyses performed in D-1

All 24 timestamps are merged and the N-1 security analysis runs on all of them. Security analysis in depth are made on the relevant timestamps to guaranty the feasibility of remedial actions across the 24 hours of the next day.

*SMART : System Modification Advice RequesT

North Stress level



	2010	2011
Red situations	2	4
Orange situations	15	47



North Stress Level Statistics, 2011

Most stressed situations on the North grid in 2011

26th November

<u>Context</u>: high wind production and high commercial cross border exchanges. <u>Day-ahead foreseen situation</u>:

- The day-ahead studies showed lots of constraints in the east part of Germany requiring several preventive actions:
 - Local redispatching
 - Inter TSO redispatching in Germany
 - Cross border redispatching between Germany, Poland and Austria
 - Preventive topological actions
- One important constraint was also observed in the West part of Germany which required specific preventive actions at the NL-DE border.

<u>CORESO proposal</u>: specific topological modifications in some substations in N state, countertrading and cancel outage to respect N-1 criteria.

- After these studies, Coreso and 50Hertz compared their studies together and participate to the DOPT teleconference where coordinated actions were discussed with other TSOs.
- These proposals where shared by Coreso, 50Hertz and the others impacted TSO.









➔ New preventive actions were necessary:

- Topology adaptation in Schmolln and Remptendorf
- High volume of Redispatching between TenneT DE, PSE-O, 50Hertz and CEPS.

Also due to the high level of wind production in Germany, constraints appear in the west of Germany close to the border with the Netherlands.

- Everyday, Coreso and Amprion have opportunities to discuss together during the DOPT conference. This situation was pointed out during the teleconference and further contacts were planned to study the details of the situation.
- During bilateral discussion with Amprion D-1 operator, Coreso's operator described his solution (based on what Coreso already observed in the past) and warned the D-1 operator of Amprion about this solution.
- Some hours later, Coreso observed that the real time operator of Amprion used Coreso's proposal.

South Stress level (Start from 1/07/2011)



	2010	2011
Red situations	-	4
Orange situations	-	39





Most stressed situations on the South grid in 2011

24th September

<u>Context</u>: all day long, high commercial import to Italy which reached 5.100MW in total. From 7:30, decrease of commercial exchanges FR>CH up to 1.500MW and from 11:30 an increase of commercial exchanges DE>CH up to 1.000MW. So the flows spreading by border is changing around midday which is induced by a unbalance in commercial exchanges on south area to fed Italy.

<u>Day-ahead foreseen situation</u>: High flows in N-state near Swiss/Italian border, due to big flows from Switzerland and low flows from France to Italy (lack of generation and planned outages in Southern France), are foreseen from midday. Coordination is needed between APG, Swissgrid, Terna and Rte to manage the flows on the Italian/Swiss border. This situation led to overloads in N-state on the 380kV tie line Pradella-La Punt-Sils-Robbia (CH – IT) up to 121% and the 220kV tie line Lienz-Soverzene (AT – IT) up to 112%.

CORESO proposal:

- Open the 220kV line Menton-Camporosso
- Change tap position in La Praz PST (tap 1) (+120MW France→Italy)
- 2 nodes topology in Lienz 220kV substation (Remaining 87% on Lienz-Soverzene)
- 1 node topology in Magenta 220kV substation to manage flows on 220kV grid near Swiss/Italian border (Line Airolo-Ponte-All Acqua not in outage in the DACF file)
- Open 380kV tie-line Pradella-Westtirol (SWG/APG)
- Redispatching in Switzerland (300MW from Pradella to Soazza)

Even with all those actions, security analyses show constraints too difficult to manage on 380kV grid and 220kV Italian grid. Therefore a **Pentalateral reduction of 500MW was recommended**.



Low generation pattern in the South-East of France

+ planned decrease of St.Alban 1 from midday (-1000MW)... **Reducing FR** + **IT physical flows**



CORESO D-1 preventive actions :



Flows & exchanges statistics for 2011 Countries Physical Exchanges

Exchanges data are extracted from Vulcanus website and UK Exchanges are provided by RTE and National Grid.













Coreso Operational Review 2011



Main Physical flows on borders



1000 2000 3000 4000 5000 Exchange value (MW)

-5000 -4000 -3000 -2000 -1000

0







Belgian Loopflows



In 2011, with the PST regulation, loopflows were within the normal range 93% of the time.

Vertical load peak



Vertical load peak of 270 116 MW between 18:00 and 19:00 (hourly average).

Aggregation of Belgian, Dutch, French, German, Luxembourg (included in BE and DE), Poland, Czech Republic, Austria, Hungary, Slovakia, Slovenia, Switzerland and Italy vertical loads.

<u>Vertical load</u> is the sum of all flows out of the transmission grid via directly connected transformers to distribution grids or other consumers.

North D-1 Commercial exchanges



South D-1 Commercial exchanges



North Intraday exchanges

These charts represent the most frequent values of intraday exchanges (in MW). For each timestamp, the intraday volume was included between the 2 percentile curves, 80% of the days.

January – March 2011

This period correspond to the winter time, when the peak demand in the North area is in the evening.



The intraday activity is higher around peak demand time: exchanges are more important but also more fluctuating. The same performance is observed in November and December.

April – October 2011

This period correspond to the summer time, when the peak demand in the north area is at noon.





Evening exchanges remain important but the differences of fluctuation and quantity with morning or noon exchanges are less significant during summer time.

South Intraday exchanges

These charts represent the most frequent values of intraday exchanges (in MW). For each timestamp, the intraday volume was included between the 2 percentile curves, 80% of the days.

As there is no intraday in Italy, this shows only the intraday exchanges between france and Switzerland.

January – March 2011 This period correspond to the winter time, when the peak demand in the South area is in the evening Hourly Statistics: FR --> CH **Hourly Standard Deviations** Intraday Intraday 300.0 2500.0 2000.0 250.0 1500.0 1000.0 200.0 500.0 Median 150.0 0.0 Percentile 0.1 -FR --> CH 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 Percentile 0.9 -500.0 100.0 -1000 0 ---- Average -1500.050.0 -2000.0 -2500.0 0.0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 -3000.0

The intraday activity is lower around peak demand time: exchanges are less important. The same performance is observed in November and December 2010.

April – October 2011

This period correspond to the summer time, when the peak demand in the south area is at noon.



Evening exchanges remain not important but the differences of fluctuation and quantity with morning or noon exchanges are less significant during summer time.

German Renewable Energy

Data are coming from EEX website. Only Germany renewable energy is described in the report.

MAIN WINDPOWER 2011 FIGURES

Maximum generated	22870 MW
Average generated	5054 MW
3 rd quartile (75% data amont < X)	7311 MW
Maximum deviation in 15 minutes	1138 MW

MAIN SOLARPOWER 2011 FIGURES

Maximum solarpower generated Average solarpower generated 3rd quartile (75% data amont < X) Maximum deviation in 15 minutes

13191 MW
2252 MW
3867 MW
1368 MW

