

UNICORN | Systems

Systems

TSC CTDS



TSC

Transmission System Operator
Security Cooperation

01 June 2014

Petr Svoboda

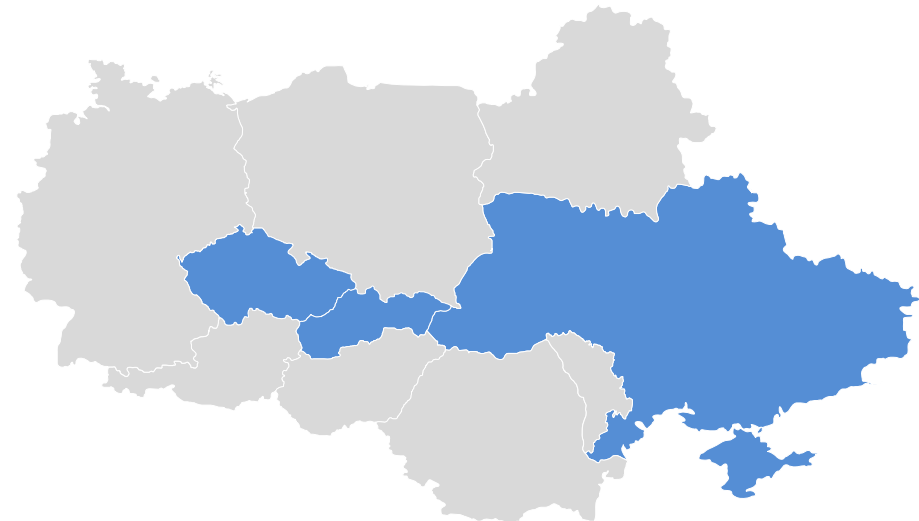
Agenda

- About Unicorn Systems
- TSC initiative introduction
- CTDS application introduction

Unicorn Systems



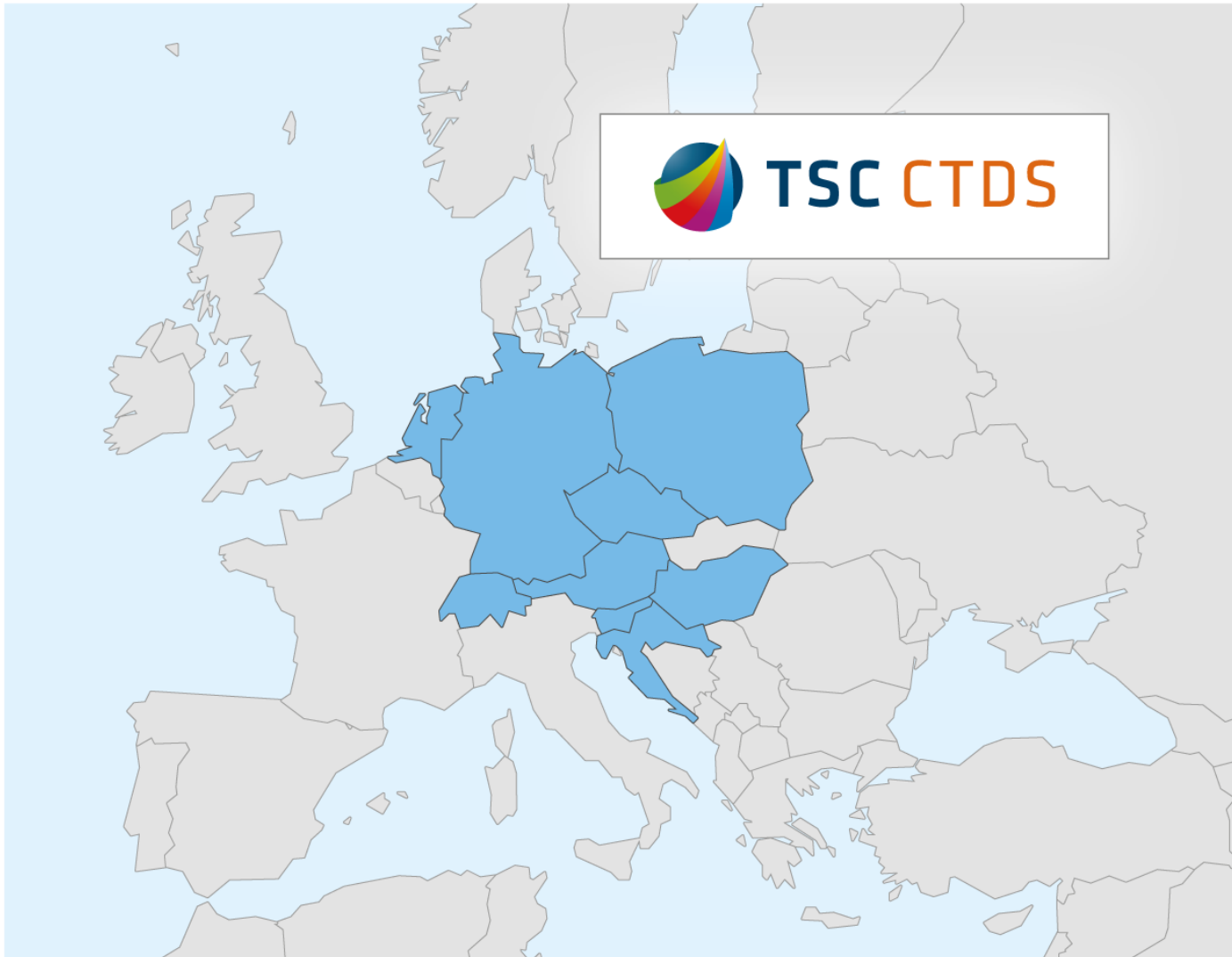
- Largest Czech ICT vendor, founded in 1990
 - 6 development centers; branch offices in the CR, SR, and Ukraine
- Total turnover for 2012 amounted to 56.6 mil. EUR, of which 24 % came from energy and utilities
- 900+ employees, about 200 of them working in energy and utilities
- First energy project completed in 1999
 - Special focus on system and market operators
- Out-of-the-box products and custom software development
- Strong technological background
- Large international projects



TSC Initiative

- TSC = Transmission System Operator Security Cooperation
- Increase security of supply through intensified regional cooperation based on a Cooperation Platform and common remedial actions
 - Processes and definitions for operational forecast data (DACF/IDCF)
 - A unique merged dataset (based on individual TSO datasets) as input for grid security calculations
 - Execution of grid security calculations and provision of results
 - Definition of additional individual studies on the Cooperation Platform on the basis of the unique merged dataset
 - Common daily evaluation of security calculation results, identification and coordination of remedial actions
 - Coordinated procedures in case of critical grid situations and remedial actions
- Joint office in Munich (opened 25. 10. 2013)
- More on the web <http://www.tso-security-cooperation.eu/>

TSC Members



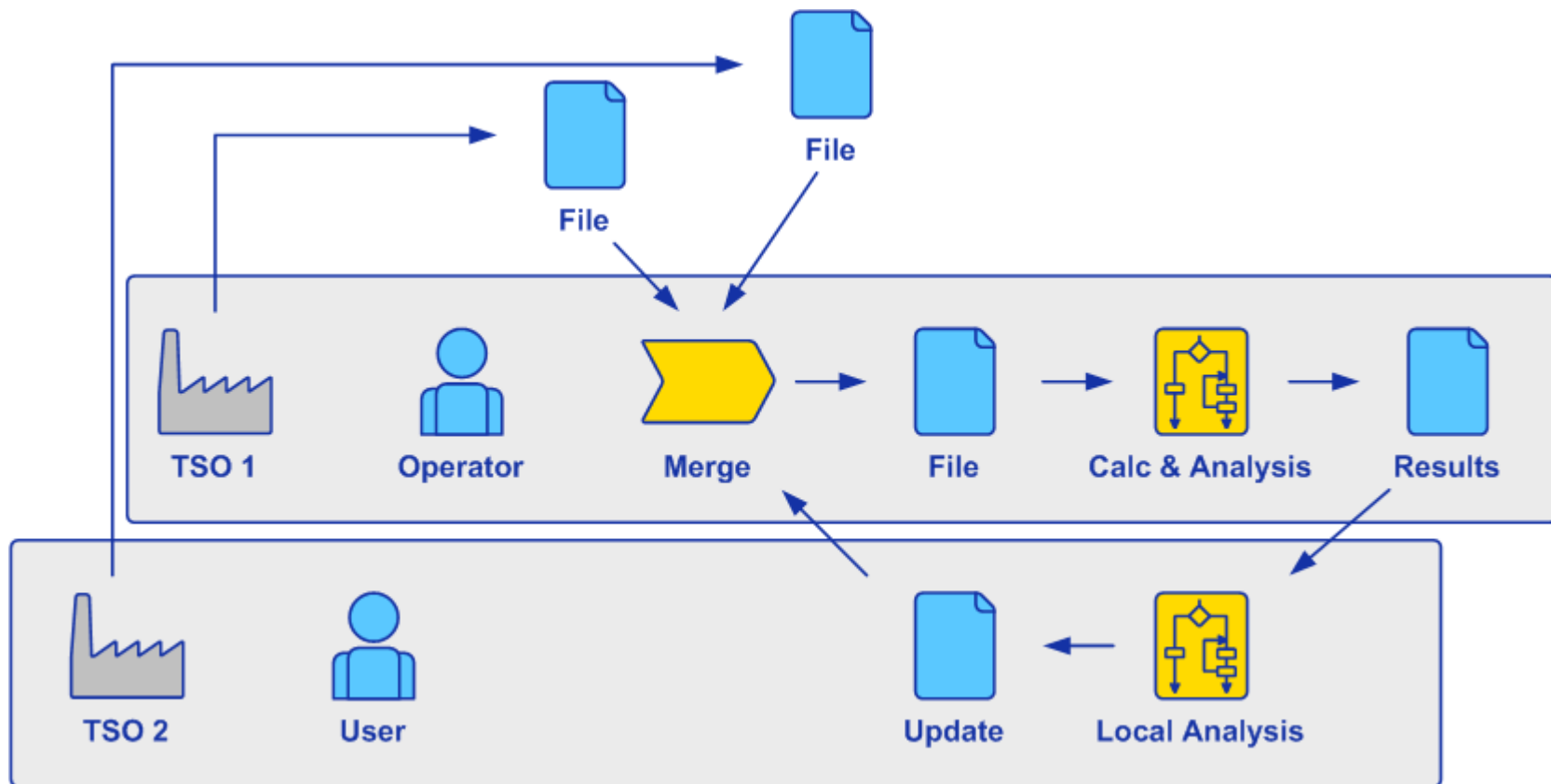
- 50Hertz (DE)
- Amprion (DE)
- APG (AT)
- ČEPS (CZ)
- ELES (SI)
- Energinet (DK)
- HOPS (HR)
- MAVIR (HU)
- PSEO (PL)
- Tennet (NL)
- Tennet (DE)
- Transnet BW (DE)
- Swissgrid (CH)

Covering area with more than 165 million European citizens in the heart of Europe

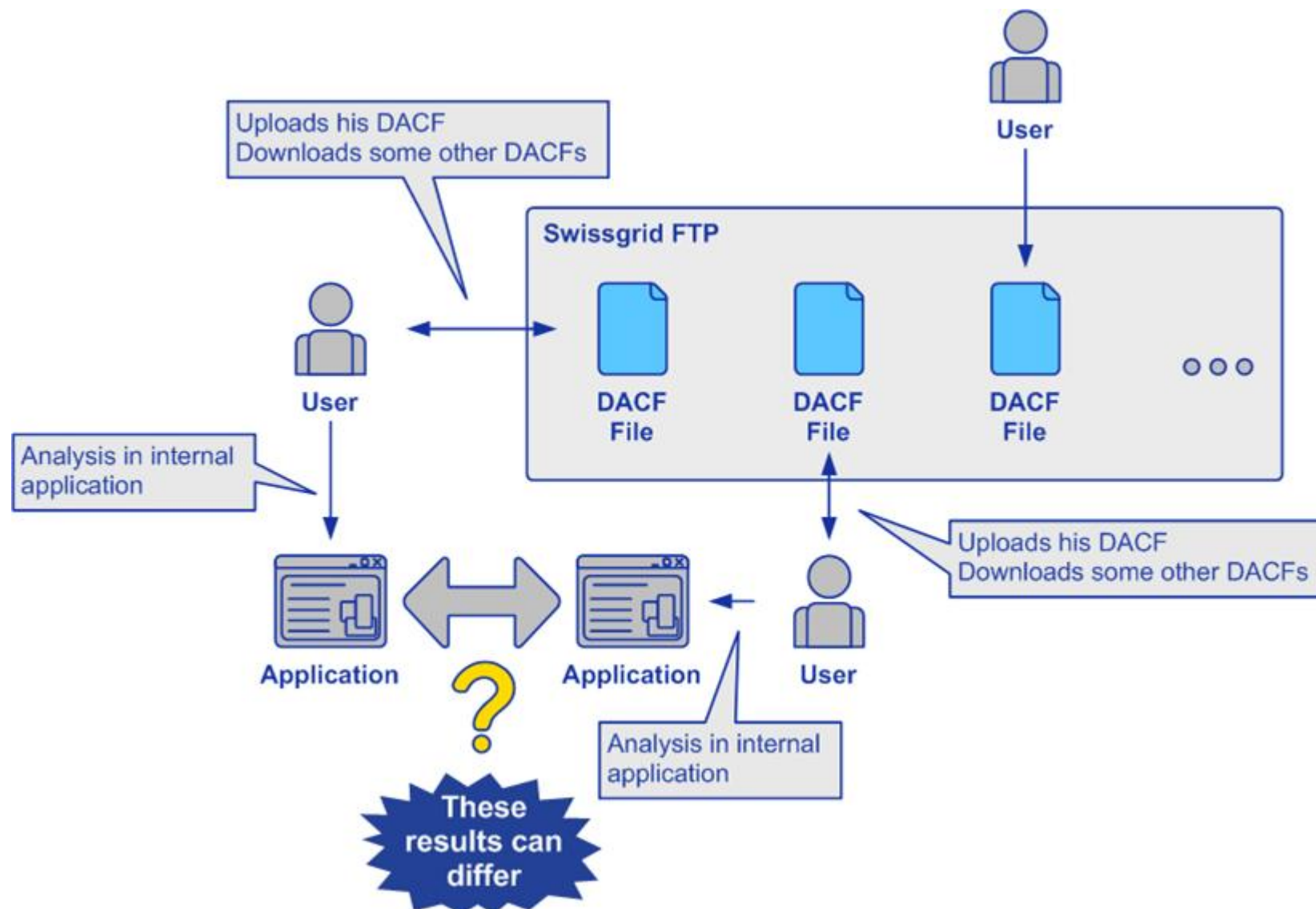
CTDS

- Common Tool for Data exchange and Security assessments
- Represents main TSC cooperation platform
- Key requirements:
 - Receiving - receiving operational forecast data from all participating TSOs and adjacent (non-participating) TSOs
 - 25 individuals models for all 24 hours of next day (i.e. 600 a day)
 - Intraday updates, every hour, one hour before real-time, for the remaining hours of the day
 - Merging - Merging input data into a unique dataset being the input for grid security calculations
 - 8000 busses and 12000 branches
 - Calculations – grid security computation (N/N-1)
 - 6500 contingency cases simulated for each hour, computed within 20 minutes
 - Studies – for further analysis over the common merged model
 - Integration platform for other functional modules

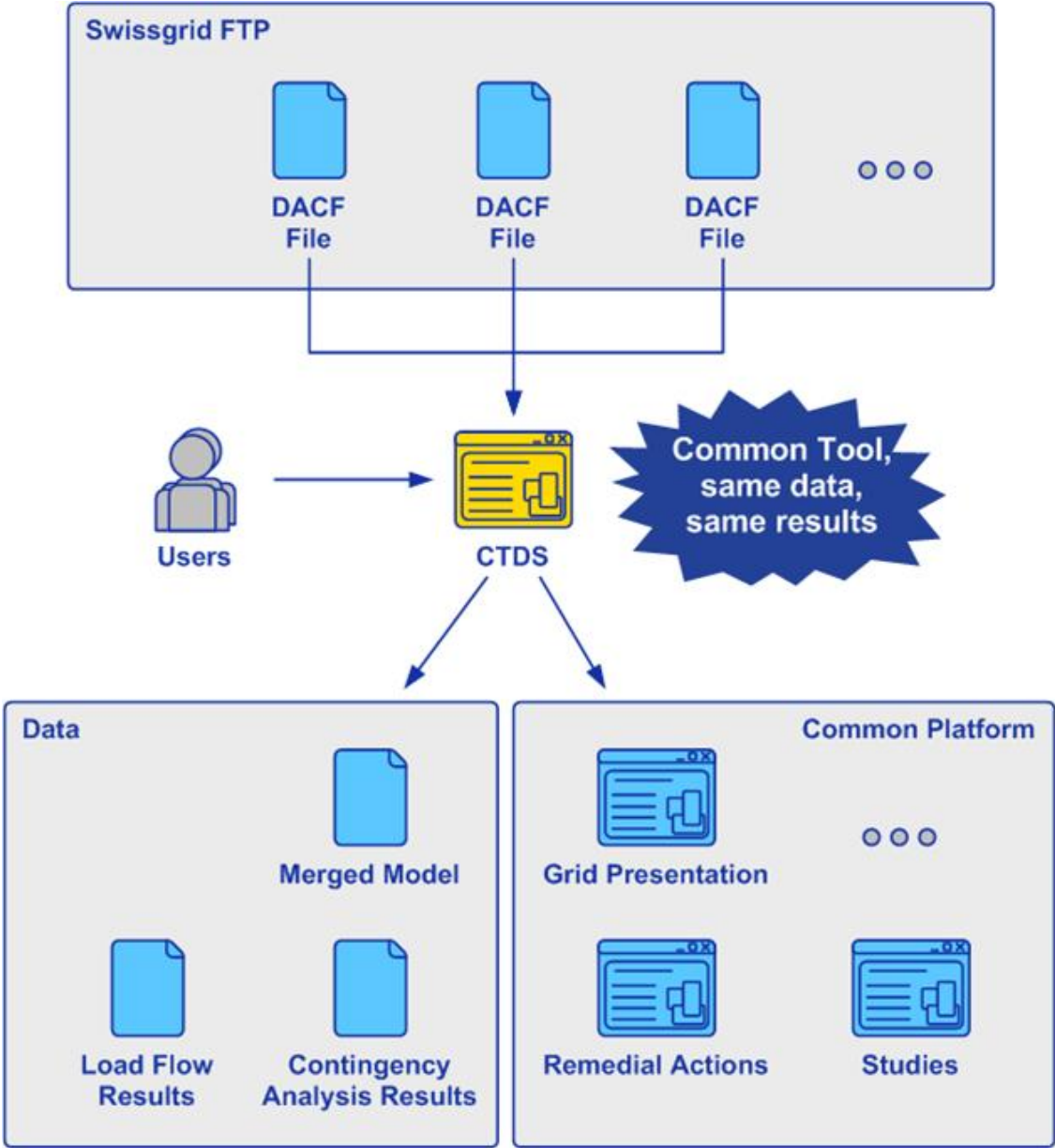
CTDS „Big Picture“



DACF process before CTDS



DACF process with CTDS

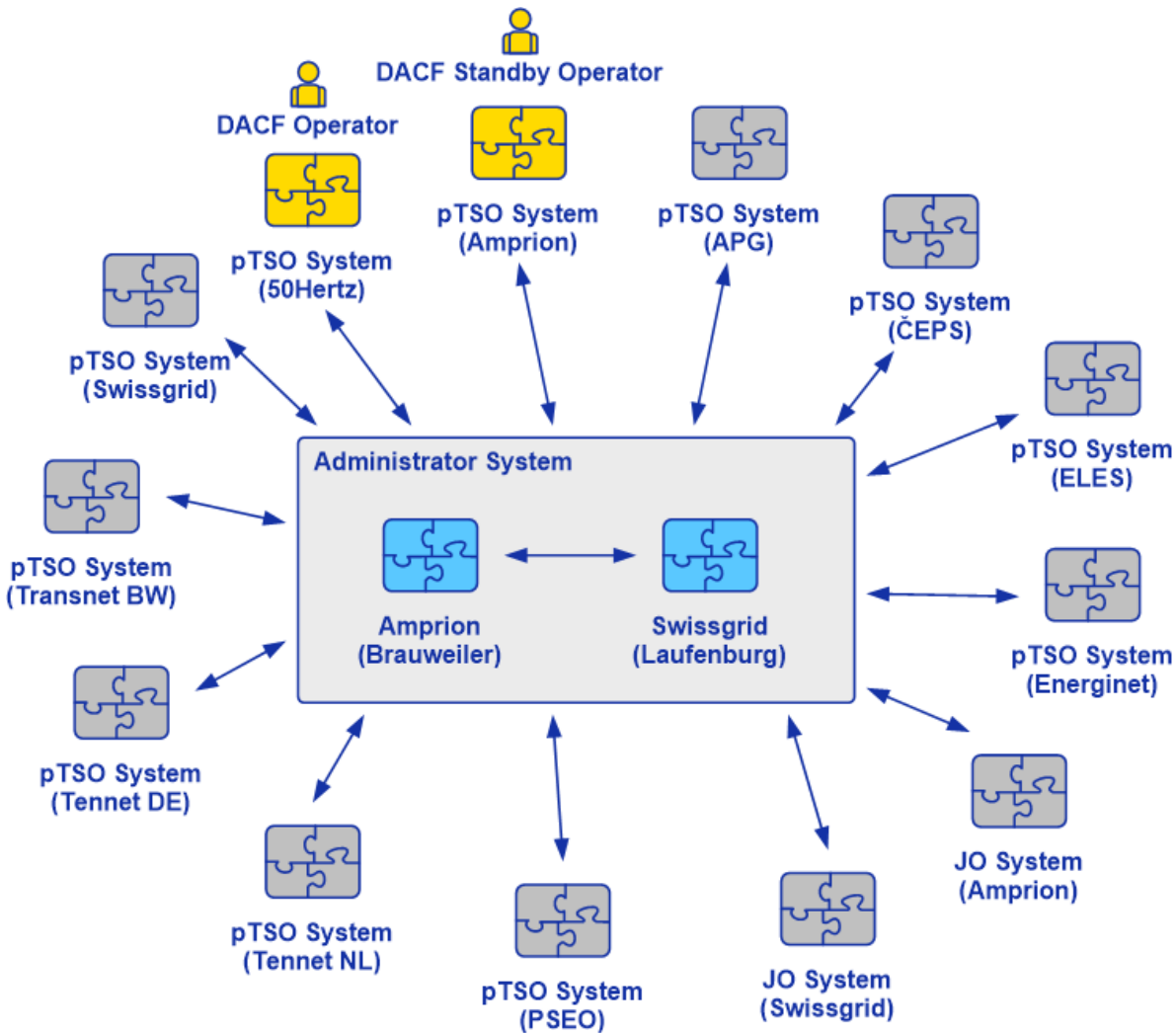


Goals of CTDS

- Avoiding risks in Central Europe
- Secure operation of interconnected grids
- Meeting cooperation requirements of European legislature

- No misunderstandings – all TSOs can work with the same data and same analytical results
- Extension current DACF process to intraday level
- Handling of unexpected major changes in flows
- Faster alerting of TSOs and coordination of remedial actions
- Possibility to simulate impact of changes on complete grid model
- Secure and decentralized solution


Decentralized Solution



- CTDS User/Operator system installation at each participating TSO
- Administrator sites installations at two hosting sites
 - Active / Passive
 - Reliable data repository and central management – shared data
- Systems interconnected via Electronic Highway using Energy Communication Platform (ECP)

Main Page

Last data refresh: 14:03 [Refresh](#)
CSPE Agent User 1 User 1 on operator system 12.05.2013 14:03



System Tools | Functional module | Configuration | DMS | Messages | User Management

Alarms

SYSTEM
D-1 contingency analysis finished with errors
11.05.2013 23:32
[Show detail](#)

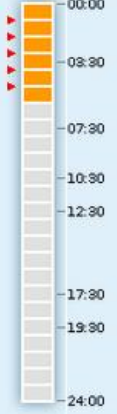
SYSTEM
D-1 contingency analysis finished with errors
11.05.2013 14:44
[Show detail](#)

SYSTEM
D-1 merging and load flow calculation finished with errors
11.05.2013 14:13
[Show detail](#)

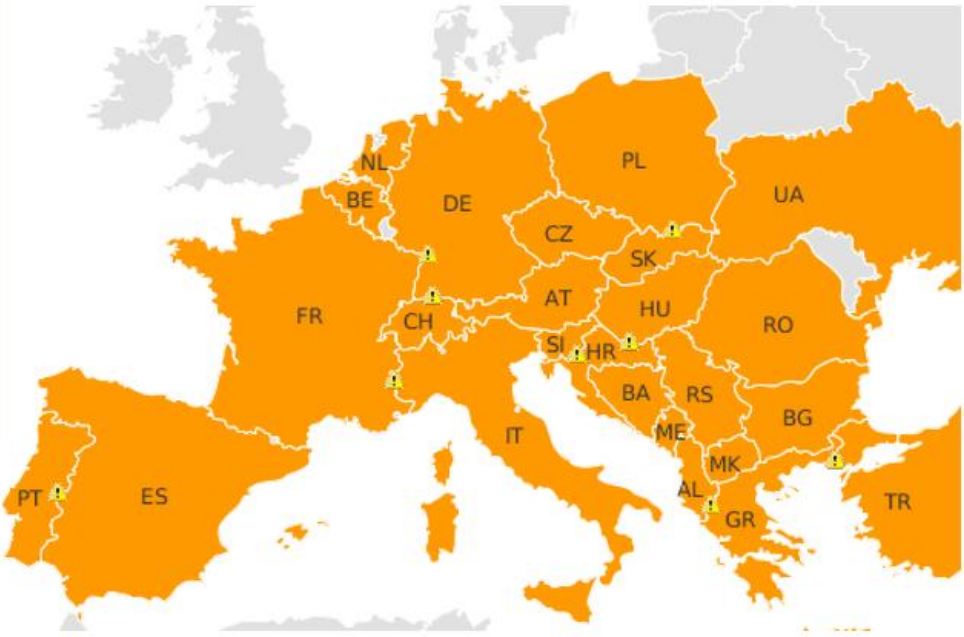
SYSTEM
Vulcanus file not in DMS
11.05.2013 13:21
[Show detail](#)

MAP | TABLE | VULCANUS

My TSO



Input file monitoring



Intraday Process

IDCF/VULC	1st Merge/LF	Wait	2nd Merge/LF	CA
↔ 02:20				

Intraday Process, additional cycle

Merge/LF	CA

Synchronization Status

Finished

Intra-day Model Improvements

CEPS

Set system state for:

OK

Distribution

Not ready

Submit

Status of All Systems

online [CSPE \(SWISSGRID\)](#)

online [CSPE \(AMPRION\)](#)

DACF operator

IDCF operator

RTSN operator

online [CEPS](#)

Events

SYSTEM
DACF files availability for substitution
11.05.2013 17:02
[Show detail](#)

SYSTEM
File synchronization finished
12.05.2013 02:59
[Show detail](#)

SYSTEM
File synchronization finished
11.05.2013 21:53
[Show detail](#)

SYSTEM
Traffic lights not green
11.05.2013 21:52
[Show detail](#)

SYSTEM
File synchronization finished

User messages

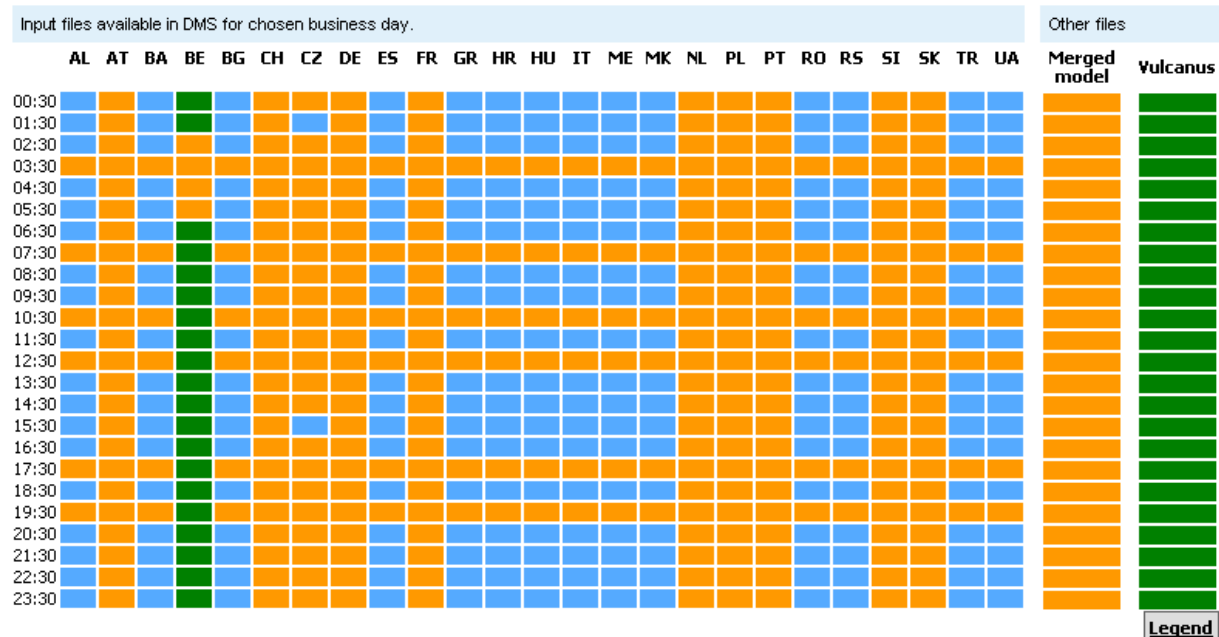
online

Input Files Monitoring

DACF (22.03.2010)
IDCF (22.03.2010)
RTSN (22.03.2010)

MAP | TABLE
VULCANUS

Current status
Used in process



Identified violations for selected TSO (without historical versions).

Show all
Hide all

Code	Rule	Severity	Rule type	Description	Line number
<div style="display: flex; justify-content: space-between; align-items: center;"> 20100322_0030_F01_CZ6 WARNING Substituted by: Delivered: 10.03.2011 12:09 Validated: 19.11.2013 14:48 </div>					
XNODE_INCONS_NOT_FOUND		INFO		Xnode inconsistency not found	-1
DATA-NODE-VOLTAGE-01	Regulated voltage out of range	WARNING	SYNTACTICAL	Regulated voltage out of range - CEDU4_14	148
DATA-NODE-VOLTAGE-01	Regulated voltage out of range	WARNING	SYNTACTICAL	Regulated voltage out of range - CEDU2_12	146
DATA-NODE-VOLTAGE-01	Regulated voltage out of range	WARNING	SYNTACTICAL	Regulated voltage out of range - CEDU1_11	145
<div style="display: flex; justify-content: space-between; align-items: center;"> 20100322_1430_F01_CZ2 WARNING Substituted by: Delivered: 03.03.2011 16:24 Validated: 19.11.2013 14:59 </div>					



LF/CA Overview

Daily Data Processing 14.04.2012 (DACF)

Compute All | Save Extracts | Change Manager | Configuration | Input Model Monitor | Security Monitor | 14.04.2012

Time	DACF Name	DACF Status	Islands	LF Status	Max. branch flow [%]	CA Status	LF Time	CA Time
00:30	20120414_0030_F06_UX.uct	WARNING	1	⚠ v2	181.1	! v1	13.4. 19:33	13.4. 19:36
01:30	20120414_0130_F06_UX.uct	WARNING	1	⚠ v2	181.4	! v1	13.4. 19:33	13.4. 19:36
02:30	20120414_0230_F06_UX.uct	WARNING	1	⚠ v2	181.9	! v1	13.4. 19:33	13.4. 19:36
03:30	20120414_0330_F06_UX.uct	WARNING	1	⚠ v2	181.1	! v1	13.4. 19:33	13.4. 19:36
04:30	20120414_0430_F06_UX.uct	WARNING	1	✅ v2	92.8	⚠ v1	13.4. 19:33	13.4. 19:36
05:30	20120414_0530_F06_UX.uct	WARNING	1	✅ v2	92.8	⚠ v1	13.4. 19:33	13.4. 19:36
06:30	20120414_0630_F06_UX.uct	WARNING	1	✅ v2	92.7	⚠ v1	13.4. 19:33	13.4. 19:50
07:30	20120414_0730_F06_UX.uct	WARNING	1	✅ v2	92.4	⚠ v1	13.4. 19:33	13.4. 19:47
08:30	20120414_0830_F06_UX.uct	WARNING	1	✅ v2	92.4	⚠ v1	13.4. 19:33	13.4. 19:47
09:30	20120414_0930_F06_UX.uct	WARNING	1	⚠ v2	179.7	! v1	13.4. 19:34	13.4. 19:36
10:30	20120414_1030_F06_UX.uct	WARNING	1	⚠ v2	179.3	! v1	13.4. 19:34	13.4. 19:36
11:30	20120414_1130_F06_UX.uct	WARNING	1	⚠ v2	179.2	! v1	13.4. 19:34	13.4. 19:36
12:30	20120414_1230_F06_UX.uct	WARNING	1	⚠ v2	179.2	! v1	13.4. 19:34	13.4. 19:36
13:30	20120414_1330_F06_UX.uct	WARNING	1	⚠ v2	180.1	! v1	13.4. 19:34	13.4. 19:36
14:30	20120414_1430_F06_UX.uct	WARNING	1	⚠ v2	180.2	! v1	13.4. 19:34	13.4. 19:37
15:30	20120414_1530_F06_UX.uct	WARNING	1	⚠ v2	179.8	! v1	13.4. 19:35	13.4. 19:36
16:30	20120414_1630_F06_UX.uct	WARNING	1	⚠ v2	178.8	! v1	13.4. 19:35	13.4. 19:37
17:30	20120414_1730_F06_UX.uct	WARNING	1	⚠ v2	178.5	! v1	13.4. 19:35	13.4. 19:36
18:30	20120414_1830_F06_UX.uct	WARNING	1	⚠ v2	177.7	! v1	13.4. 19:35	13.4. 19:37
19:30	20120414_1930_F06_UX.uct	WARNING	1	⚠ v2	177.2	! v1	13.4. 19:35	13.4. 19:36
20:30	20120414_2030_F06_UX.uct	WARNING	1	⚠ v2	178.4	! v1	13.4. 19:35	13.4. 19:37
21:30	20120414_2130_F06_UX.uct	WARNING	1	✅ v2	92.7	⚠ v1	13.4. 19:35	13.4. 19:46
22:30	20120414_2230_F06_UX.uct	WARNING	1	✅ v2	92.7	⚠ v1	13.4. 19:35	13.4. 19:51
23:30	20120414_2330_F06_UX.uct	WARNING	1	⚠ v2	180.6	! v1	13.4. 19:36	13.4. 19:36

Timestamp 12:30

Open

Close

Compute LF

Compute CA

Grid

Balances

Navigation

Save Changes

LF Report

LF Compare

CA Report

Outaged Elements

Use as a study

LF converges but some violations identified (mostly Q limits are ignored)

CA error – model does not converge (Q limits are not ignored for CA to prevent unrealistic results)

Max branch flow in the whole model

CA warning – some violations exist

Security Report

192.168.81.113 - Připojení ke vzdálené ploše

Security Monitor 15.3.2010

15.3.2010		AL	AT	BA	BE	BG	CH	CZ	D1	D2	D4	D6	D7	D8	ES	FR	GR	HR	HU	IT
00:30	base n-0		79.6%				69.3%	74.8%		89.8%	67.6%	30.7%	57.8%	49.6%						
	CA n-1		124.6%				123.0%	126.3%		163.1%	83.6%	44.3%	111.1%	96.0%						
01:30	base n-0		79.6%				69.3%	74.8%		89.8%	67.6%	30.7%	57.8%	49.6%						
	CA n-1		124.6%				123.0%	126.3%		163.1%	83.6%	44.3%	111.1%	96.0%						
02:30	base n-0		79.6%				69.3%	74.8%		89.8%	67.6%	30.7%	57.8%	49.6%						
	CA n-1		124.6%				123.0%	126.3%		163.1%	83.6%	44.3%	111.1%	96.0%						
03:30	base n-0		83.3%				57.0%	74.9%		89.8%	67.6%	40.9%	57.8%	56.7%						
	CA n-1		124.6%				79.9%	90.0%		163.5%	92.7%	57.8%	111.1%	109.4%						

rVal	aVal	Type	Subst1	Subst2	Order	Status	Name	EName	TSO	xSubst1	xSubst2	xOrder	xStatus	xName	xEName	xTSO
163.5%	1553.6	line	SIEM 220	LBEC 220	1	real(in)	D2SIEM2_D2LBEC2_1	B LAU	D2	D2SIEM5			real(in)	D2SIEM54		D2
153.7%	1460.4	line	SIEM 220	LBEC 220	1	real(in)	D2SIEM2_D2LBEC2_1	B LAU	D2	SIEM 380	D2SIEM5	1	real(in)	D2SIEM1_D2SIEM5_1	T411	D2
129.5%	865.1	line	AS 220	GKRO 220	1	real(in)	D2AS_2_D2GKRO2_1	3	D2	AS 220	GKRO 220	2	real(in)	D2AS_2_D2GKRO2_2	4	D2
128.2%	856.5	line	AS 220	GKRO 220	2	real(in)	D2AS_2_D2GKRO2_2	4	D2	AS 220	GKRO 220	1	real(in)	D2AS_2_D2GKRO2_1	3	D2
127.1%	848.7	line	AS 220	GKRO 220	1	real(in)	D2AS_2_D2GKRO2_1	3	D2	GKRO 220			real(in)	D2GKRO26		D2

08:30	base n-0		82.9%				54.4%	74.9%		89.8%	67.6%	42.6%	57.8%	52.2%						
	CA n-1		124.6%				77.8%	89.8%		163.5%	90.8%	60.0%	111.1%	106.0%						
09:30	base n-0		83.3%				54.4%	74.9%		89.8%	67.6%	42.6%	57.8%	52.3%						
	CA n-1		124.6%				77.8%	89.8%		163.5%	90.8%	60.1%	111.1%	106.0%						
10:30	base n-0		83.3%				57.0%	74.9%		89.8%	67.6%	40.9%	57.8%	56.9%						
	CA n-1		124.6%				79.9%	90.0%		163.5%	92.7%	57.8%	111.1%	109.4%						
11:30	base n-0		77.3%				59.0%	76.1%		89.8%	67.6%	40.5%	57.8%	56.7%						
	CA n-1		124.6%				81.9%	87.8%		163.5%	93.8%	57.4%	111.1%	111.7%						
12:30	base n-0		83.3%				57.0%	74.9%		89.8%	67.6%	40.9%	57.8%	56.9%						
	CA n-1		124.6%				79.9%	90.0%		163.5%	92.7%	57.8%	111.1%	109.4%						
13:30	base n-0		77.7%				59.0%	76.1%		89.8%	67.6%	40.5%	57.8%	56.7%						
	CA n-1		124.6%				82.1%	87.8%		163.5%	93.8%	57.5%	111.1%	111.7%						
14:30	base n-0		77.7%				59.0%	76.1%		89.8%	67.6%	40.5%	57.8%	56.7%						
	CA n-1		124.6%				82.1%	87.8%		163.5%	93.8%	57.5%	111.1%	111.7%						
15:30	base n-0		81.0%				64.4%	74.4%		91.2%	67.7%	39.3%	58.3%	58.0%						
	CA n-1		124.6%				102.5%	101.0%		163.3%	83.2%	54.1%	111.3%	112.5%						
16:30	base n-0		82.6%				54.5%	74.9%		89.8%	67.6%	42.6%	57.8%	52.3%						
	CA n-1		124.6%				77.8%	89.8%		163.5%	90.8%	60.0%	111.1%	106.0%						
17:30	base n-0		82.1%				57.0%	74.9%		89.8%	67.6%	40.8%	57.8%	56.8%						
	CA n-1		124.6%				79.9%	90.0%		163.5%	92.7%	57.7%	111.1%	109.4%						

Load Flow Results

Load flow report 15.03.2010 22:30 (DACF)

File View Help

22:30 15.3.2010 LF CA

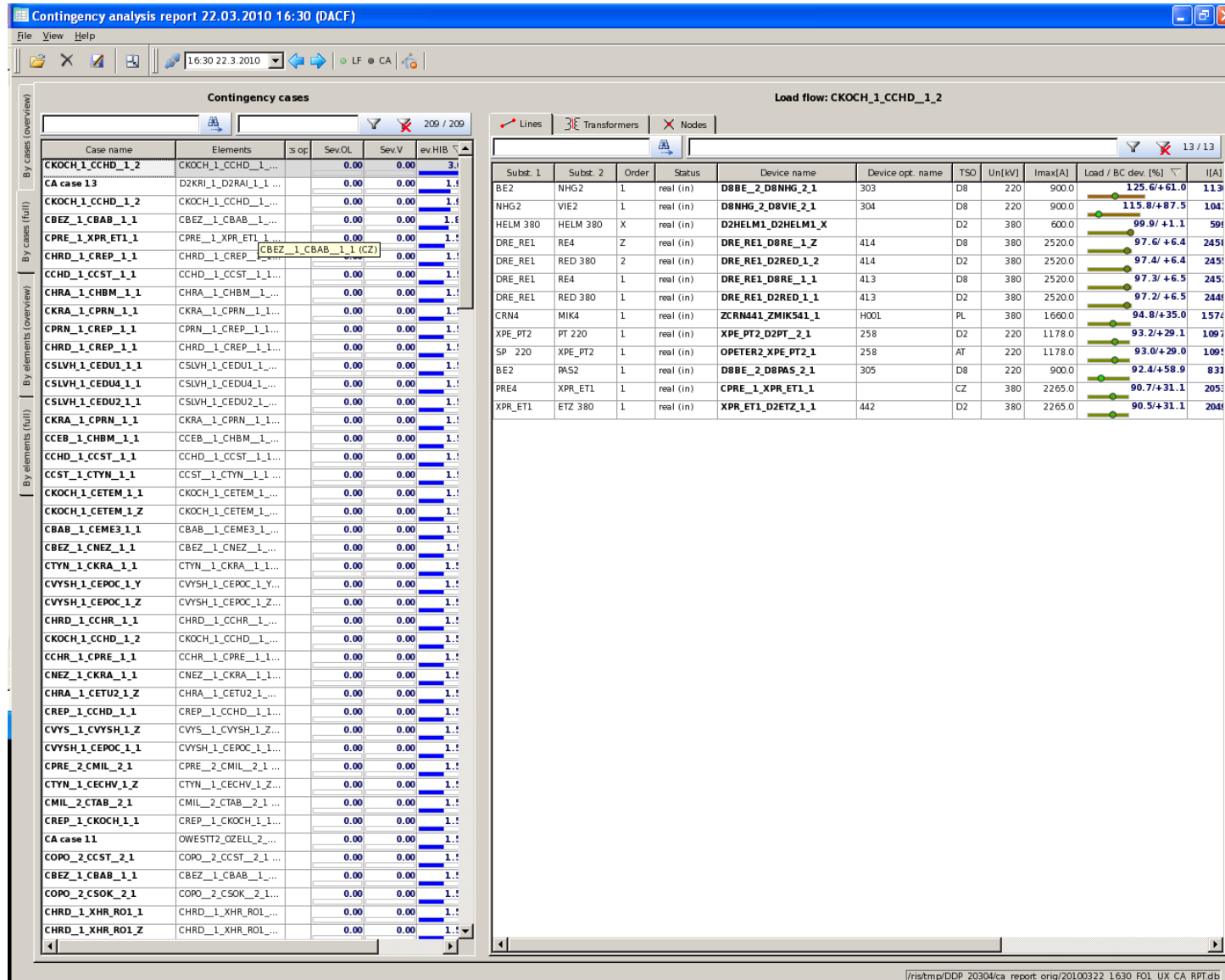
Lines Transformers Nodes Tie-lines Bilateral exchanges Calc. details

11419 / 11419

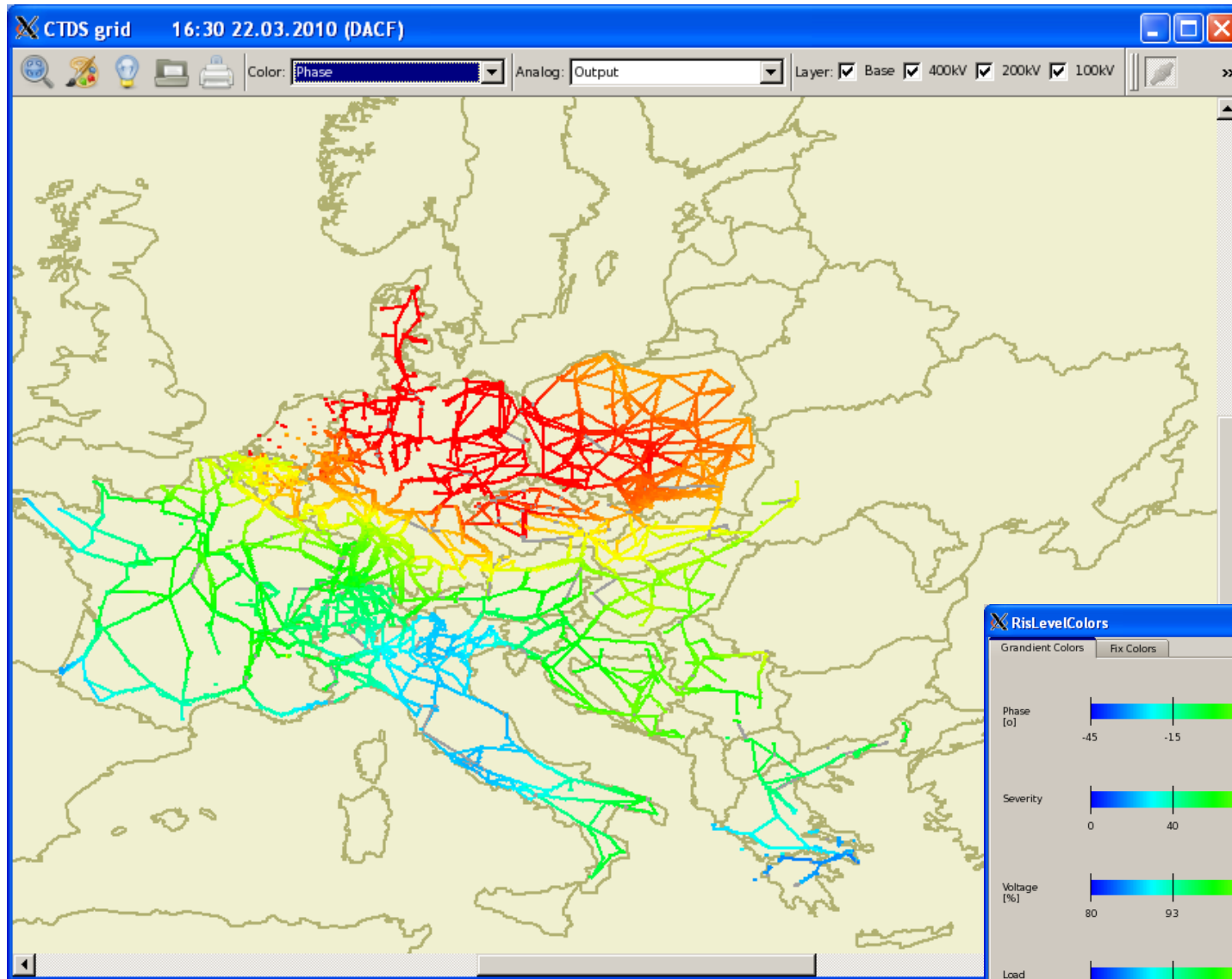
Subst. 1	Subst. 2	Order	Status	Name	Opt. name	TSO	Un[kV]	I _{max} [A]	load[%]	I[A]	P1[MW]	Q1[MVar]	th1[deg]	P2[MW]	Q2[MVar]	th2[deg]
LI 220	XLI_SO2	1	real (in)	OLIENN2_XLI_SO2_1	261	AT	220	750.0	110.92	831.9	-342.3	-3.3	-5.62	333.9	-33.0	-12.9
XLI_SO2	SOVER220	1	real (in)	XLI_SO2_ISOAVA2_1	OV2215 1	IT	220	750.0	110.70	830.3	-333.9	33.0	-12.97	326.2	-66.0	-19.9
HELM 380	HELM 380	X	real (in)	D2HELM1_D2HELM1_X		D2	380	600.0	97.39	584.3	-409.1	26.5	28.48	408.9	-25.4	28.2
FBOLL52	FTERRA2	1	real (in)	FBOLL52_FTERRA2_1	BOLL561TERRA	FR	220	889.0	96.44	857.3	-353.1	12.7	-4.62	344.8	-44.7	-11.0
RICEN220	IGADM12	1	real (in)	INOMM12_IGADM12_1	MM2L16 1	IT	220	535.0	96.13	514.3	-202.6	73.9	-21.04	202.3	-40.6	-21.3
PAKS 400	PAKS 400	Y	equiv (in)	MPAKS_1_MPAKS_1_Y		HU	380	743.0	91.79	682.0	491.0	-80.8	6.42	-491.0	80.0	6.5
PAKS 400	PAKS 400	1	equiv (in)	MPAKS_1_MPAKS_1_1		HU	380	743.0	89.42	664.4	478.0	-80.7	6.42	-478.0	80.0	6.5
AVOI_220	AVOI_220	1	real (in)	FAVOI52_FAVOIN2_1	AVOI561LAVOIN	FR	220	900.0	85.91	773.2	-316.4	25.6	-2.42	316.3	-21.5	-2.6
AVOI_380	FCHIN21	1	real (in)	FAVOI51_FCHIN21_1	AVOI571CHIN2	FR	380	1580.0	82.42	1302.2	897.7	-116.0	4.50	-897.8	121.9	4.6
MAAD 220	WHAV 220	1	real (in)	D2MAAD2_D2WHAV2_1	BLAU	D2	220	2052.0	81.53	1672.9	678.8	-31.3	25.71	-679.3	26.1	26.1
BEE4	TRE4	1	real (in)	ZBEE141_ZTRE141_1	E403	PL	380	1500.0	81.18	1217.7	-824.0	256.6	29.06	818.6	-269.1	26.3
ROGNA220	FROROU2	1	real (in)	FROGNA2_FROROU2_1	ROGNA61ROROU	FR	220	1160.0	80.57	934.6	373.1	-26.1	-20.50	-377.0	3.7	-16.4
HEYD 380	OVEN 380	1	real (in)	D2HEYD1_D2OVEN1_1	1	D2	380	1440.0	80.40	1157.8	-816.7	108.4	20.52	816.1	-109.9	20.1
PAKS 400	PAKS 400	Z	equiv (in)	MPAKS_1_MPAKS_1_Z		HU	380	837.0	80.12	670.6	482.6	-80.7	6.42	-482.6	80.0	6.5
REALT220	FSEPT2	3	real (in)	FREALT2_FSEPT2_3	REALT63SEPT2	FR	220	1160.0	78.68	912.7	-365.6	21.8	-20.72	364.7	-26.8	-21.7
FMOUIS2	FTERRA2	1	real (in)	FMOUIS2_FTERRA2_1	MOUIS61TERRA	FR	220	889.0	78.52	698.1	278.7	-48.1	-13.10	-280.7	40.9	-11.0
GRANZ220	FZGRA62	1	real (in)	FGRANZ2_FZGRA62_1	GRANZ61ZGRA6	FR	220	1337.0	76.75	1026.2	-424.7	-18.7	-5.71	418.9	-15.3	-10.9
AVOI_380	FCHIN21	2	real (in)	FAVOI51_FCHIN21_2	AVOI572CHIN2	FR	380	1700.0	75.93	1290.8	888.7	-123.4	4.50	-888.8	128.7	4.6
FRAN.P2	FRANCE2	1	real (in)	FRAN.P2_FRANCE2_1	RAN.P61RANCE	FR	220	260.0	75.92	197.4	80.0	9.5	-10.77	-80.0	-8.0	-10.7
BOG2	CPC2	1	real (in)	ZBOG422_ZCPC422_1	4020	PL	220	800.0	75.25	602.0	234.6	7.1	22.15	-237.3	-19.6	26.7
HAMN 220	STDE 220	1	real (in)	D2HAMN2_D2STDE2_1	ROT	D2	220	626.0	75.06	469.9	-188.1	8.4	26.76	186.0	-12.8	23.3
CPC2	MIK2	1	real (in)	ZCPC422_ZMIK422_1	4011	PL	220	1062.0	74.04	786.3	310.8	23.4	26.76	-316.1	-53.5	33.4
MVAV 220	MVAV 220	1	real (in)	IMFTV12_IMFZV12_1	VV2193 1	IT	220	800.0	73.40	587.2	-237.3	42.2	-20.52	237.2	-42.9	-20.7
REALT220	FSEPT2	1	real (in)	FREALT2_FSEPT2_1	REALT61SEPT2	FR	220	1160.0	72.72	843.5	-337.9	19.9	-20.72	337.1	-24.7	-21.7
IMTJT12	LEJNI220	1	real (in)	IMTJT12_ILEYTA2_1	TT2215 1	IT	220	280.0	72.52	203.1	-83.5	-0.7	-5.76	82.8	8.4	-7.9
FPORG2	FROROU2	1	real (in)	FPORG2_FROROU2_1	PORG61ROROU	FR	220	889.0	72.23	642.1	-259.6	20.2	-14.27	257.4	-27.0	-16.4
SIEM 220	LBEC 220	1	real (in)	D2SIEM2_D2LBEC2_1	BLAU	D2	220	950.0	71.97	683.7	-265.7	83.2	30.36	265.5	-48.0	30.0
KUMM 220	STDE 220	1	real (in)	D2KUMM2_D2STDE2_1	GELB	D2	220	626.0	71.83	449.7	-178.1	20.7	25.20	177.0	-22.8	23.3
FMOUIS2	FPORG2	1	real (in)	FMOUIS2_FPORG2_1	MOUIS61PORG	FR	220	889.0	71.40	634.7	-253.1	47.7	-13.10	252.0	-51.2	-14.2
EDC380	EEM380	1	real (in)	NEDC381_NEEM381_1	EEM-EDC380 1	NL	380	1425.0	71.24	1015.2	-700.0	0.0	13.19	699.9	-1.7	13.0
IPMLV52	IST4VC2	1	real (in)	IPMLV52_IST4VC2_1	VV2M10 1	IT	220	784.0	70.75	554.7	-221.4	31.1	-23.54	221.3	-28.6	-23.6
FDEPHT2	PRAGN220	2	real (in)	FDEPHT2_FPRAGN2_2	PRAGN62DEPHG	FR	220	690.0	69.78	481.5	185.6	-74.5	-16.53	-185.6	74.1	-16.4
XLA_KU2	KUHMO	2	real (in)	XLA_KU2_D4KUHMO2_2	HOTZ	D4	220	1200.0	69.34	832.1	283.3	-188.3	-2.92	-283.9	186.2	-2.4

/ris/tmp/DDP_12558/lf_report/20100315_2230_F01_UX_LF_RPT.db

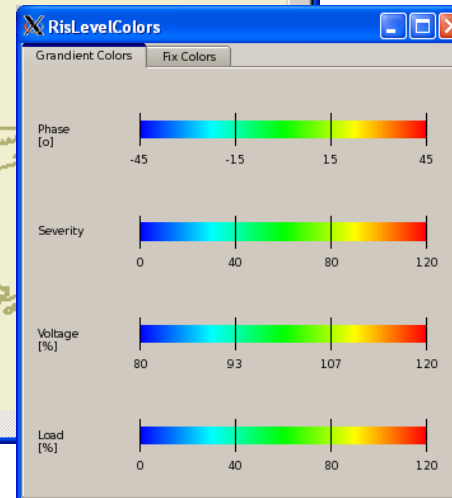
Contingency Analysis Results



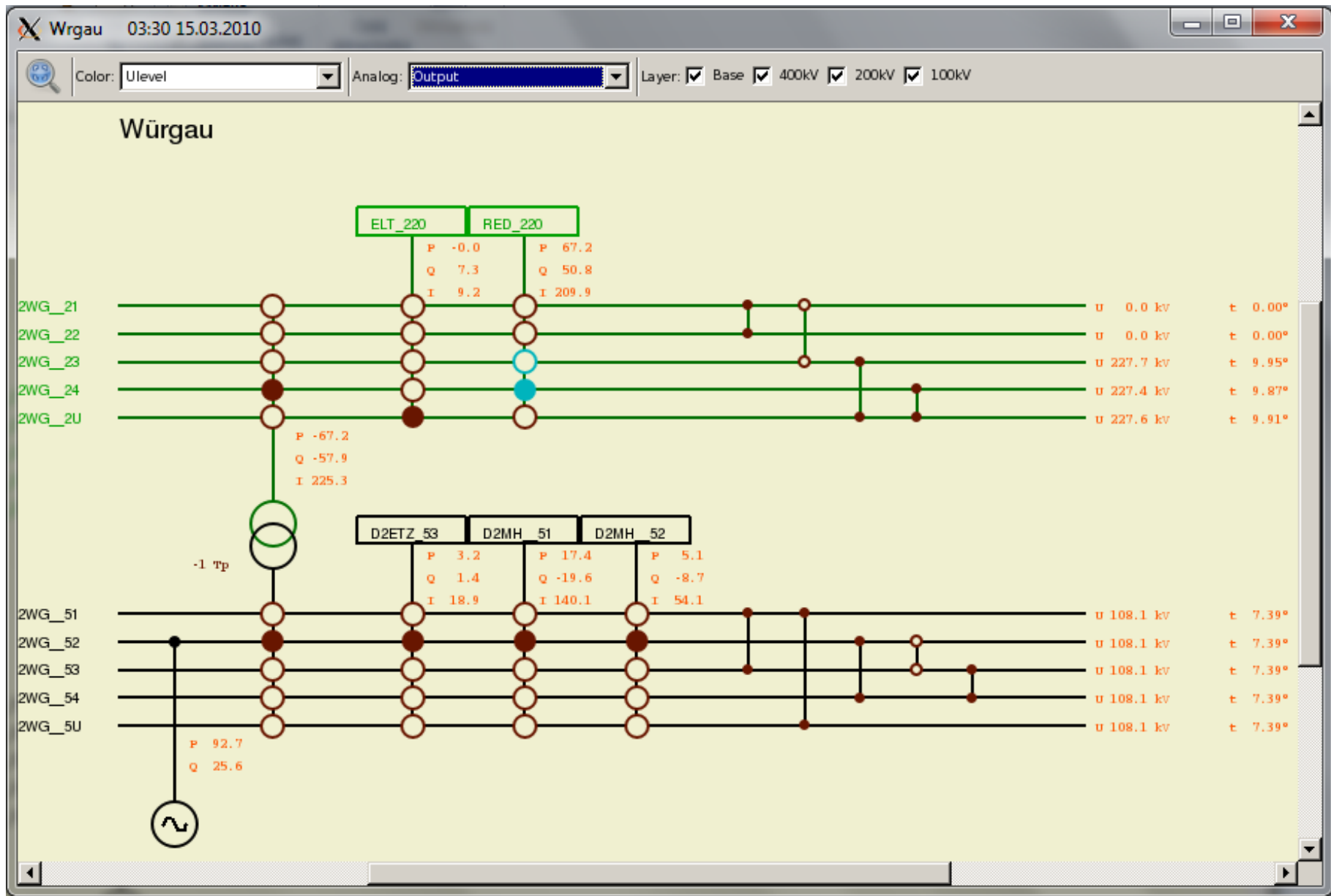
Geographical Presentation



- Load
- Ulevel
- Topology
- Phase angle
- Severity index
- Voltage



Substation Detail

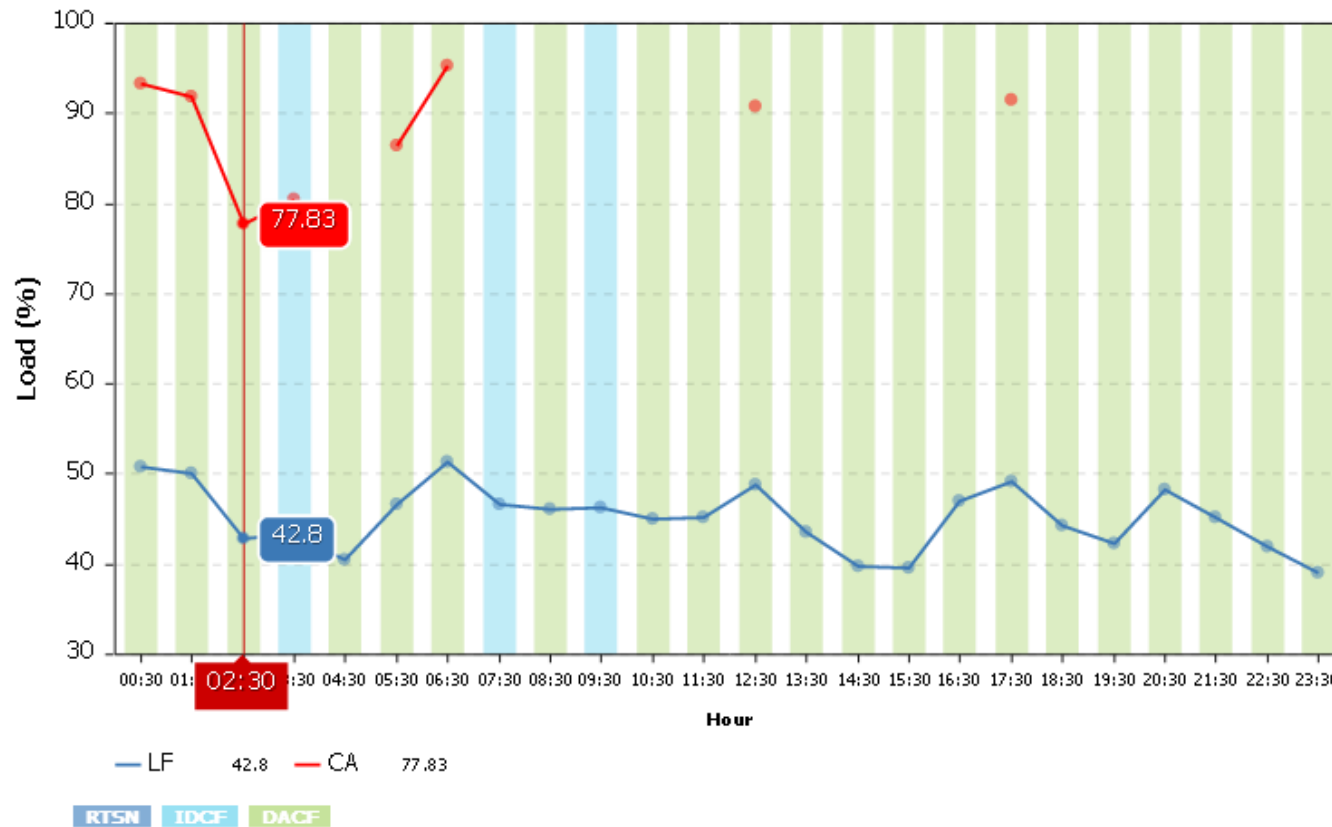


Trend Analysis

Trend Analysis For A Day

Date 22.03.2010 Display Configuration

Trend overview



Detailed information about the worst LF and CA result

Load Flow

Load % 42.8
S2
Type
Substation1 CPRE_22
Substation2 CVIT_21
Order 1
Status 0
Name CPRE_2_CVIT_2_1
EName
TSD CZ

Contingency Analysis

Affected Element

Load % 77.83
S2
Type
Substation1 CPRE_22
Substation2 CVIT_21
Order 1
Status 0
Name CPRE_2_CVIT_2_1
EName
TSD CZ

Contingency Case

Substation1 CPRE_21
Substation2 CVIT_22
Order 2
Status 0
Name CPRE_2_CVIT_2_2
EName
TSD CZ

Trend table

List of Elements	Optional names	00:30		01:30		02:30		03:30		04:30		05:30		06:30		07:30		08:30		09:30		10:30		11:30		12:30		13:30		14:30	
		LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA	LF	CA
CPRE_2_CVIT_2_1		50.78	93.23	50.07	91.88	42.8	77.83	38.79		37.83	39.44		43.67	44.88	46.15	46.24	42.03	41.7	42.19	43.56	39.7										
CVIT_2_CHRA_2_1		18.47	18.06	39.58	43.37	80.49	40.53	46.66	86.49	51.31	95.31	46.69	43.09	46.08	45.04	45.23	48.75	90.84	41.47	25.1											

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