

Electricity Coordinating Center Ltd Elektroenergetski koordinacioni centar d.o.o.



# TNA

#### general software presentation

Elektroenergetski Koordinacioni Centar d.o.o. Electricity Coordinating Center Ltd. V. Stepe 412, 11040 Belgrade 33, Serbia <u>www.ekc-ltd.com</u> gm@ekc-ltd.com

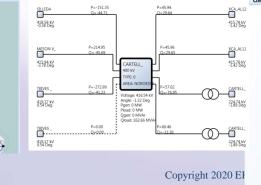


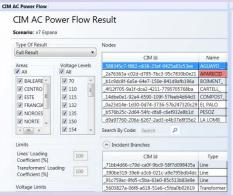


**Transmission Network Analyzer** in development since 2009, by EKC and SE DMS TNA provides analytic and short-term planning functions, suitable for TSOs and RCCs

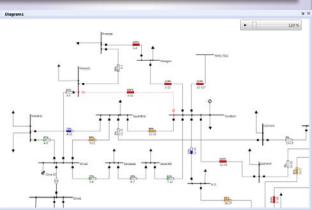
- Calculation of static load flow (AC, DC)
- Contingency analyses (n-1, n-x), Remedial Actions
- Automatic transmission capacity calculation: NTC, Flow-based (PTDF/RAM)
- Day Ahead Congestion Forecast (DACF) procedure, D2CF, IDCF
- Network models building, validation, merging, conversion (UCTE, RAW, CIM/CGMES)
- Sensitivity analyses (zonal, nodal PTDF, OTDF, PSDF, DCDF, PFC, FLD)
- Statistics (contingencies, losses)
- Short circuit analyses







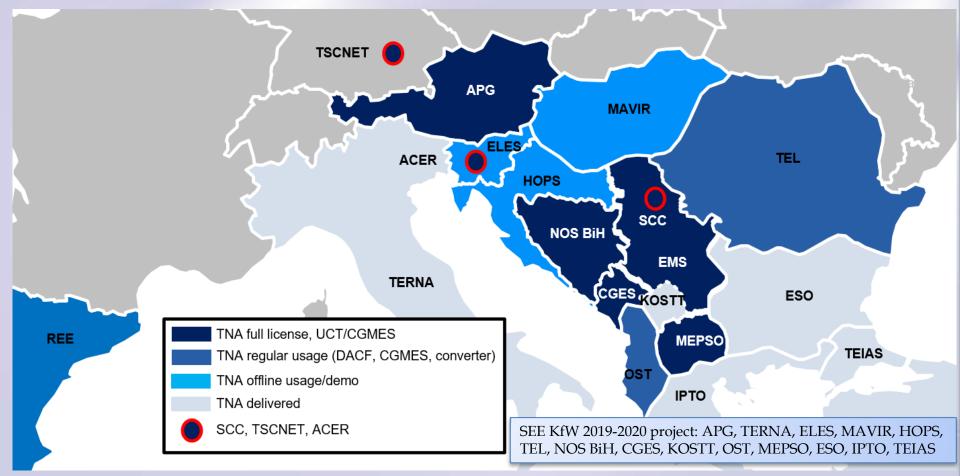






TSOs: TNA is provided to 16 TSOs in Continental Europe, in everyday usage by 8 TSOs (APG, CGES, EMS, MEPSO, NOSBiH, OST, REE, Transelectrica)

RCCs:SCC Belgrade (primary tool), TSCNET Munich (secondary tool), CORESO (PFC function)Regulators: ACER Ljubljana, delivery projects 2017 and 2019



### TNA -CGMES

Attestation of Conformity: Gold

#### ENTSO-E, Brussels June 2015

Standard		Bronze
Profile	Equipment Boundary	Gold
Profile	Topology Boundary	Gold
Profile	Equipment core	Gold
Profile	Equipment short circuit	Gold
Profile	Equipment operation	Gold
Profile	Topology	Gold
Profile	Steady State Hypothesis	Gold
Profile	State Variables	Gold
Profile	Dynamics	n/a
Profile	Diagram Layout	Gold
Profile	Geographical Location	Gold
Function	Import	Gold
Function	Export	Gold
Function	Update and Repository	Gold
Function	Diagram Layout	Gold
Function	Geographical (GIS) location	Gold
Function	Load Flow (Node-breaker input representation)	Gold
Function	Load flow (Bus-branch input representation)	Gold
Function	Dynamics	n/a
Function	Short circuit	Gold

# entsoe

#### ATTESTATION OF CONFORMITY

Date of issue: 08 June 2015

Attestation number: 2014/08/001

The European Network of Transmission System Operators for Electricity (ENTSO-E), hereby declares that, in accordance with the section 5.1.2 of the CGMES Conformity Assessment Framework adopted on 11 April 2014, a second party assessment has been performed for the Application:

> Transmission Network Analyser Version 2

for which an Attestation of Conformity was sought by Schneider Electric DMS NS D.O.O., a company registered in Serbia with registered offices at Narodnog fronta 25 A, B, C, D, Novi Sad, Serbia (corporate number 20422882) and Electricity Coordinating Center D.O.O., a company registered in Serbia with registered offices at Vojvode Stepe 412, PO Box 50, 11040 Belgrade, Serbia (corporate number 06971121).

ENTSO-E declares that the Opinion Body issued a positive opinion on the Conformity of the Application (Declaration of Conformity 05/12/2014) with the requirements of the Common Grid Model Exchange Standard (CGMES) version 2.4.15, the Conformity Assessment Scheme version 1.1.1 and asked the Assessment Body to issue this Attestation of Conformity for the following CGMES conformity levels:

In accordance with the section 5.1.2.2 of the CGMES Conformity Assessment Framework, this Attestation of Conformity shall be valid for the full lifetime of this specific version of the Application, unless withdrawn in accordance with the procedure described in section 6.2 of the CGMES Conformity Assessment Framework.

For the avoidance of doubt, this Attestation of Conformity reflects the opinion of the Opinion Body on the Conformity of the Application with the requirements of the CGMES but cannot be regarded as granting any right or obligation of any kind towards third parties.

Broch, 9/6/15 Place, Date

Konstantin Staschus, Secretary General

CGMES Conformity Assessment Body • cgmes.conformity@entsoe.eu • www.entsoe.eu ENTSO-E AISBL • Avenue de Cortenbergh 100 • 1000 Brussels • Belgium • Tel + 32 2 741 09 50 • Fax + 32 2 741 09 51

### TNA 2.3 Functionalities:

TNA functionality	Туре
AC Load Flow	Function
DC Load Flow	Function
Area Interchange	Function
Contingency: n-x (AC, DC)	Function
OTDF (AC, DC)	Function
Island Checker	Function
Network reduction	Function
Network equivalent	Function
Generation&Load shift	Function
NTC calculation, single	Function
Flow-based calculation (PTDF/RAM)	Function
PTDF/OTDF usage for CB/CO filtering	Function
Nodal PTDF	Function
Power Flow Colouring/Decomposition (PFC, FLD)	Function
DACF/D2CF/IDCF procedure	Function
NTC calculation, 24 hours (embedded in D2/DACF/ID)	Function
Short circuit (fault) calculation	Function
Contingency Builders	Builder
Monitoring Builders	Builder
Model Builder	Builder
CRAC builder	Builder
Graphical Builder	Builder
GSK Builder (for FB)	Builder
CBCO builder (for FB)	Builder
API functionality	Tool
Models validation & merging	Tool
Statistics: model validation	Tool
Statistics: losses	Tool
Statistics: contingency	Tool
Models conversion CGMES/UCT/RAW	Tool
Floating License Server (FLS)	Tool

### TNA 2.3 Load flow

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TNA	Analyzer v1.7.111.197											
File	e Functions Builders Tools Option											
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	odels	₹₽×	Single Node View	OWIEN 11 AC P	ower Flow AC Syst	tem Summary AC Po	wer Flow					
	nctions Builders		AC Power	Flow Result								
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. ≜	DC Load Flow	Ctrl+D	Scenario: W2013 b	ezKBII Model: 201	30116_1030_RE3_UX0	_bezKB-11_v2						
1	PTDF&MF Daily		Type Of Result		Nodes							
	PTDF&MF Monthly/Yearly		Full Result	•	Node Code 1	Voltage	Angle	Pgen	Pload	Qgen	Qload	1
1	AC OTDF		Areas	Voltage Levels	OZELL 21	233.3	-33.2	0.0	85.0	- Agen	Qioso	<u> </u>
5			All		OZELL 11	408.8	-32.5	70.0	0.0			
		Ctrl+C	I AL ▲ I AT ■	750 🔺	OYMELL12	403.3	-38.2	0.0	0.0			
1 X		Ctrl+X	AT E	<b>4</b> 00	OYMELL11	403.3	-38.2	0.0	0.0			
ê			BA	<ul> <li>✓ 220</li> <li>✓ 150</li> </ul>	OYBBSF21 OWIEN 21	238.5 238.8	-20.2 -24.9	145.0 0.0	27.0			
6		Ctrl+S	BG	✓ 150 ✓ 120	OWIEN 11	406.4	-28.2	0.0	-300.0		P=120.73	
		Ctrl+B	🗹 СН	✓ 110	OWESTT21	232.3	-32.1	0.0	139.0		<sup>21</sup> 0=95.81	.23 P
	Post Auction Contingency Analysis	carro	🗹 CZ 🛛 👻	70 🗸	OWESTT11	401.2	-31.0	0.0	0.0	238.841		ן ר
ЧŻ					OWEISS21	236.2	-31.2	0.0	43.0	-24.86 [		
8		Ctrl+I	Limits		OWALLS21 OTERNI29	237.7 233.4	-20.4 -30.9	149.0 0.0	25.0			
* 8		Ctri+1	Lines' Loading	100	OTENVIDO	233.4	20.0	0.0	10.0	OWIEN	21 P=120.7123	
	Island Checker		Transformers' Loa	ding	Search By Code: S	earch 🔎				<u> </u>	()) = 0 = 95.81	
	Net Transfer Capacity		Coefficient [%]	100	Branches					238.84		OWIEN 11
	Outage Transfer Distribution Factors		Voltage Limits —		biancies					-24.86 [	Deg	400 kV
	Contingency Analysis			Min p.u. Max		Area CKT	P Q	S Ploss	Qloss Sn			TYPE: 0
	AC/DC Comparison		750 0.95	1.05	OWIEN 21 AT OWIEN 21 AT		120.7 95.8 120.7 95.8	154.1 0 154.1 0		OSUEDI	B11 P=572.286 O=-15.15	7 AREA: AT
	Base Flow Reliability Margin		400 0.95	1.05	OSUEDB11 AT		572.3 -15.2	572.5 3		0-		Voltage: 406.36 kV
	PTDF/OTDF Usage For CBCO		220 0.95	1.05	OSARA 11 AT	-	-355.1 -43.4	357.8 0		404.23   -33.66 [		Angle: -28.24 Deg Pgen: 0 MW
	Post Auction Contingency Analysis		150 0.95	1.05	OSARA 11 AT		-357.8 -38.5	359.9 0		55,000		Pload: -300 MW
	Area Interchange		120 0.95 110 0.95	1.05	OOSTST11 AT	-	571.2 -29.9	572.0 5		00484	P=-355.1	Qgen: 0 MVAr 189 Qload: 13 MVAr P
	Island Checker		70 0.95	1.05	OBISAM11 AT XWI_SZ11 XX		-517.8 18.9 145.8 -96.6	518.1 2 174.9 0			O=-43.35	
	Net Transfer Capacity		27 0.95	1.05	AVVI_3211 XX	V	742.0 -30.0	1/4.9 0	-40.0	407.61	kV	
Ŭ			330 0.95	1.05						-27.26 [		
			500 0.95	1.05								

All Export		NTC -	a baada a di							T										port Areas
Area	Include		rt Methods:		,						rt Methods:								Area	Include
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MK		© G€	eneration Shift	t Lists						() G	eneration Shif	t Lists							GR	
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RS		Area	Node Code	Pg [MW]	dPg [MW]	К	Pmin	Pmax		Area	Node Code	Pg [MW]	dPg [MW]	К	Pmin	Pmax			HU	
SI	•	RS	JTKOSB12	250	10	1	170	260	-	BA	WUGLJE1	249.69	79.69	1	170	275	•		MK	
Selected	Export Areas	RS	JTKOSB11	250	10	1	160	260		BA	WTUZL62	179.3	49.3	1	130	200			Selecte	ed Import Areas
Area	Ratio(%)	RS	JTKOSA2	240	30	1	100	270		BA	WTETUZ2	329	199	1	130	364	1		Area	Ratio(%)
RS	87.66	RS	JTENTB12	450	130	1	480	580		BA	WSALAK2	34.9	7.9	1	27	210			BA	100
ME	12.34	RS	JTENTB11	450	130	1	480	580		BA	WHRAMA2	69.8	14.8	1	55	160	1			
	*	RS	JTENTA24	220	60	1	200	280	-	BA	WHEVIS1	80	20	1	60	315				
		RS	JTENTA23	220	60	1	200	280	11	BA	WHETRE2	49.9	23.9	1	26	180				
_	f selected export areas	RS	JTENTA22	150	41	1	120	191		BA	WHEDUB2	89.698	35.7	1	54	105		_		of selected im
	Node Code Pg	RS	JTENTA21	150	41	1	120	191		BA	WGRABO2	34.9	4.9	1	30	114				Node Code WUGLJE1
	TKOSB12 250 •	RS	JTENTA12	220	80	1	200	300		BA	WGACKO1	249.88	79.88	1	170	275	- 1		BABA	WUGLEI WTUZL62
	TKOSA2 240 =					1	_		- 11		WUACKUI	245.00	/9.88	1	1/0	275			BA	WTETUZ2
	TENTB12 450	RS	JTENTA11	220	60	1	200	280											BA	WSALAK2
	JTENTB11 450	 RS	JTDRMN11	300	0	1	220	290											BA	WHRAMA2
RS J	ITENTA24 220	RS	JHDJE111	651	249	1	400	900											BA	WHEVIS1
RS J	ITENTA23 220	RS	JHBIST2	100	2	1	10	102											BA	WHETRE2
RS J	ITENTA22 150				2	1	1.0		*								•		BA	WHEDUB2
	ITENTA21 150		SUM:	4491.16	1132.84	18					SUM:	1367.07	515.07	10					BA	WGRABO2
	······································											AIC L	ocal Slacks:						•	
			I	mport NTC				Limit: 1	00		[MW]	◎ : C	n	R	un NTC					
Node	e Code: Search 🔎		F	Export NTC				Step: 5	0		[MW]	: C			Close				Noc	de Code: Searc

#### Net Transfer Capacity Results

Outage details

Node 2

WTUZLA1

HTUMBR1

JRPDRM11

JPANC211 JBGD8 12 JBBAST21

JBGD3 22

JBGD5 22

JBGD3 22

JBGD1723 JHDJE111

JHIP 2

JBGD3 21

Node 1

WUGLIE1

HMELIN1 JBGD8 12 JBGD8 11 JBGD8 11 JBGD8 11 JBGD3 21

JBGD3 21

JBGD5 21 JBGD8 22

JBGD8 22

JBOR 21 JBGD8 22

JBGD8 21

Scenario: SEE 22.02.2012 Model: 20120222\_1030\_FO3\_SEE0.uct

### TNA: NTC calculation

Select	Step	DEmax [MW]	Outages	Overloaded	Max loading [%]	
	0	0	252	1	85.8	
0	1	50	252	2	87.7	
0	2	100	252	2	89.5	
0	3	150	252	2	91.4	
0	4	200	252	2	93.3	
0	5	250	252	3	95.1	
0	6	300	252	3	97.0	
0	7	350	252	3	98.9	
•	8	400	252	4	100.8	
0	9	450	252	6	102.7	
0	10	500	252	6	104.6	

CKT Overloaded -

1 2

xport areas		Import areas	
Area name		Area name	
RS	-	BA	
	-		

489.1 [MW]

260.38 [MW]

171.26 [MW]

53.23652 [%]

100.0 [MW]

Details of the overloaded elen	nents		Calculated pa	arameters		
Overloaded elements HMRACL2 HZERJA2 1	Loading [%] 100.8	À .	NTC	389.1	[MW]	ττς
HZERJA2 HZERJA1 1	85.2					
			NTF	89.12	[MW]	TTF
			BCE	89.1	[MW]	TRM
			DEmax	400.0	[MW]	DFma
			PTDFbase	100.0262	[%]	PTDFr
		-		I		

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### Flow based calculation (PTDF/RAM)

ower Flow	Calculate	& Report							Load Flo	w settin	gs for I	RAM ca	alculatio	on									
ed Calculation	Calculate	PTDFs betv	veen						Base to	ology				🗸 Enf	force O I	limits for							
ed calculation	O All Ar	eas							• Full	Newton-	Raphso	on			nerators								
· Voltages	Partic	ipating are	as only						⊖ Fast	decoupl	led Nev	vton-Ra	aphson	-									
ency Analysis	PTDF	values for	CB/CO	pairs						oad Flov	N												
Calculation	PTDF	values for	Tie Line	s					Outage	topologi	ies			Enforce Q limits for									
		Tie Lines							• Full	Newton-	Raphso	on			nerators								
Adjustment	• Tie	Lines from	partici	pating a	areas				⊖ Fast	decoupl	led Nev	vton-Ra	aphson	-									
	RAM	values								oad Flov	N												
		otify RAM le	ess than	3	[%]	Fmax			D-6	. ()													
									Reference														
	Au	tomatically	replac	e low R/	AM with	3	[%] F	max						e Exchar	-								
	Reme	dial Action	ς (RΔ)											ange of a				DCE 6	la la				
		port only C		Δ result					• Nem	ove nere	rence c	base Ca	se exch	ange or p	participa	ting Area	as, iron	I BCE II	le				
		port both (				result			✓ Rest	ore Norr	ninated	Progra	ms, fror	n Alread	y Nomin	ated Tra	nsactio	ns (AN1	T) file				
				nu co/	20/1141	csuit			Rest	ore Allo	cated Pi	rogram	s, from	Already a	allocated	d Transac	tions (A	AT) file	•				
		istribution																					
														Oł	(	Cance	2	Defa	ults				
Critical branch	Critical outage		FRM 12	FRM 21	FAV 12	FAV 21	Imax Sn	nom	U1 U2	Smax	Fmax	Fref	Fnp			Cance				AAF 21	RAM 12	RAM 21	
	Critical outage	Cos Phi	[MW]	[MW]	[MW]	[MW] [	[A] [M	IVA]	[kV] [kV]	[MVA]	[MW]	[MW]	[MW]	F0 F	RAMnet 12 [MW]	RAMnet 21 A [MW] [	ANF I MW] [	Fref'	AAF 12 [MW]	[MW]	[MW]	[MW]	
Critical branch XER_SM11_JSMIT21_CKT_1	Critical outage	Cos Phi		[MW] 119.7	[MW] 59.9	[MW] [ 59.9	[A] [M 1920	VVA] 1330.2		[MVA] 1330.2	[MW]	[MW]	(MW) 7 0	F0 F	RAMnet 12	RAMnet 21 4 [MW] [ 860.9	ANF I MW] [	Fref' [MW] -156.7	AAF 12 [MW] 0		[MW]		ELIA
	Critical outage	Cos Phi O PDTF from RTE	(MW) 119.7 o	[MW] 119.7	[MW] 59.9 TTN 0.004812	[MW] [ 59.9 PSE [ 0.000023	[A] [M 1920 REN SE 0.002188 0	MVA] 1330.2 EPS 0.158076	(kV) (kV) 400 40 TEIAS OST 0.153497 -0.00494	[MVA] 0 1330.2 APG 8 0.157663	[MW] 1197.2 ESO 0.037094	[MW] -156.7 HOPS -0.017173	[MW] 7 0 MAVIR 3 0.161249	F0 [ [MW] [ -156.7 MEPSO 1 0.140554	RAMnet 12 [MW] 1174.3 Transelectr 0.217392	RAMnet 21 A (MW) [ 860.9 EMS E -0.012926	ANF 1 MW] 1 CLES 1 0.02086	Fref' [MW] -156.7 WPS 0.000024	AAF 12 [MW] 0 NOSBIH 0.000759	(MW) 0 TERNA 0.160079	[MW] 1174.3 IPTO 0.148367	[MW] 860.9 CGES -0.000047	-0.0
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	Critical outage	Cos Phi O PDTF from RTE TTN PSE REN	[MW] 119.7 o 0.000037 -0.004812 -0.00023	[MW] 119.7 RTE -0.000037 -0.004849 -0.000061	[MW] 59.9 TTN 0.004812 0.004849 0.004788	[MW] [ 59.9 PSE 6 0.000023 0.000061 -0.004788	[A]         [M]           1920         8           0.002188         0           0.002225         0           -0.002624         0           0.002164         0	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.158052	[kV]         [kV]           400         40           TEIAS         OST           0.153497         -0.00494           0.153535         -0.00490           0.148685         -0.00975           0.153474         -0.00496	[MVA] 0 1330.2 APG 8 0.157663 5 0.1577 5 0.152851 5 0.157639	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197	[MW] 7 0 MAVIR 8 0.161249 5 0.161286 5 0.156437 7 0.161225	F0 [MW] [ -156.7 MEPSO 0.140554 0.140554 0.140592 0.135742 0.140531	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217429 0.21258 0.217368	RAMnet 21 A [MW] [ 860.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295	ANF 1 MW] 0 ELES 1 0.02086 0.020898 0.016049 0.020837	Fref" [MW] -156.7 WPS 0.000024 0.000022 -0.004788 0.000001	AAF 12 [MW] 0 NOSBIH 0.000759 0.000796 -0.004053 0.000735	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344	[MW] 860.9 CGES -0.000047 -0.00001 -0.004859 -0.000071	-0.00 -0.00 -0.00 -0.00
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE	[MW] 119.7 o 0.000037 -0.004812 -0.000023 -0.002188	[MW] 119.7 RTE -0.000037 -0.004849 -0.000061 -0.002225	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624	[MW] [ 59.9 PSE 8 0.000023 0.000061 -0.004788 -0.002164	[A]         [M]           1920         SE           0.002188         0           0.002225         0           -0.002624         0           0.002164         0	MVA] 1330.2 EPS 0.158076 0.158113 0.153264	[kV]         [kV]           400         40           TEIAS         OST           0.153497         -0.00494           0.153535         -0.00490           0.148665         -0.00975           0.153474         -0.00496           0.15131         -0.00713	[MVA] 0 1330.2 APG 3 0.157663 5 0.1577 5 0.152851 5 0.157639 1 0.155475	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197 -0.019361	[MW] 7 0 MAVIR 8 0.161249 5 0.161286 5 0.156437 7 0.161225 1 0.159061	F0 [MW] [ -156.7 MEPSO 0.140554 0.140554 0.140592 0.135742 0.140531	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217429 0.21258 0.217368 0.215204	RAMnet 21 A [MW] [ 860.9 EMS E -0.012926 -0.012889 -0.012889 -0.01295 -0.01291	ANF 1 MW] 0 ELES 1 0.02085 0.020898 0.016049 0.020837 0.018673	Fref" [MW] -156.7 WPS 0.000024 0.000024 0.000024 0.000021 -0.004788 0.000001 -0.002164	AAF 12 [MW] 0 NOSBIH 0.000759 0.000796 -0.004053 0.000735 -0.001429	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179	[MW] 860.9 CGES -0.000047 -0.00001 -0.004859 -0.000071 -0.002235	-0.00 -0.00 -0.00 -0.00 -0.00
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST	[MW] 119.7 0 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497	[MW] 119.7 RTE -0.000037 -0.004849 -0.000061 -0.002225 -0.158113 -0.153535	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685	[MW] [ 59.9 PSE 6 0.000023 0.000061 -0.004788 -0.002164 -0.158052 -0.153474	[A]         [M]           1920         SE           0.002188         0           0.002225         0           -0.002624         0           0.002164         0           -0.155888         -0.15131	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.158052 0.155888 0.004579	[kV]         [kV]           400         40           TEIAS         OST           0.153497         -0.00494           0.153535         -0.00490           0.148685         -0.00975           0.153147         -0.00496           0.15347         -0.00496           0.15347         -0.00496           0.15347         -0.00496           0.15347         -0.00496           0.15141         -0.00713           -0.004579         -0.1584	[MVA] 0 1330.2 APG 8 0.157663 5 0.1577 5 0.152851 5 0.157639 1 0.155475 9 -0.000413 4 0.004165	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907 -0.120982 -0.116403	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197 -0.019361 -0.175249 -0.17067	[MW] 7 0 MAVIR 3 0.161249 5 0.161286 5 0.156437 7 0.161225 1 0.159061 9 0.003173 7 0.007751	F0 [MW] [MW] 1 -156.7 MEPSO 0.140554 0.140554 0.140592 0.138367 -0.017522 -0.017522	RAMnet 12 (MW) 1174.3 Transelectr 0.217392 0.217392 0.21258 0.217368 0.215204 0.059316 0.063895	RAMnet 21 A [MW] [ 860.9 EMS E -0.012926 -0.012889 -0.017738 -0.017738 -0.015114 -0.015114 -0.015102	ANF 1 MW] 1 0.02085 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.000001 -0.002164 -0.158052 -0.153473	AAF 12 [MW] 0 NOSBIH 0.000759 0.000759 -0.004053 0.000735 -0.001429 -0.157317 -0.152739	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002003 0.006582	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513	[MW] 860.9 CGES -0.000047 -0.00001 -0.004859 -0.004859 -0.0002235 -0.158123 -0.153545	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15
	Critical outage	Cos Phi O PDTF from RTE TTN PSE REN SEPS TEIAS OST APG	[MW] 119.7 0 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.004943	[MW] 119.7 RTE -0.000037 -0.004849 -0.000061 -0.002225 -0.158113 -0.153535 0.004905	[MW] 59.9 TTN 0.004812 0.004849 0.004888 0.002624 -0.153264 -0.148685 0.009755	[MW] [ 59.9 PSE 6 0.000023 0.000061 -0.004788 -0.002164 -0.158052 -0.153474 0.004966	[A]         [M]           1920         SE           0.002188         0           0.002225         0           -0.002624         0           0.002164         0           -0.155888         -0.15131           0.0007131         0	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.155828 0.004579 0.163019	[kV]         [kV]           400         40           TEIAS         OST           0.153497         -0.00494           0.153535         -0.00496           0.153537         -0.00496           0.15131         -0.00735           0.15131         -0.00736           -0.05360         -0.16301           -0.05844         -0.15844	[MVA] 0 1330.2 APG 8 0.157663 0.15775 0.152851 0.155475 9 -0.000413 4 0.004165 0.162605	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907 -0.120982 -0.116403 0.042037	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197 -0.019361 -0.175249 -0.17067 -0.01223	[MW] 7 0 MAVIR 3 0.161249 5 0.161286 5 0.156437 7 0.161225 1 0.159061 9 0.003173 7 0.007751 3 0.166192	F0 [MW] [ [MW] 1 -156.7 MEPSO 0.140554 0.140592 0.135742 0.140531 0.138367 -0.0138267 -0.013522 -0.012943 0.145497	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217429 0.21258 0.217368 0.2127368 0.215204 0.215204 0.215204 0.215204 0.222335	RAMnet 21 / (MW) [ 860.9 EMS E -0.012926 -0.012889 -0.01738 -0.015114 -0.015114 -0.015102 -0.015114 -0.0171002	ANF 1 MW] 0 ELES 1 0.02085 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803	Fref' MW] -156.7 WPS 0.000024 0.000062 -0.004788 0.000001 -0.002164 -0.158052 -0.153473 0.004967	AAF 12 [MW] 0 NOSBIH 0.000759 0.000759 0.000759 -0.004053 0.000735 -0.001429 -0.157317 -0.152739 0.005702	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002003 0.006582 0.165022	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331	[MW] 860.9 CGES -0.000047 -0.00001 -0.004859 -0.00071 -0.002235 -0.158123 -0.153545 0.004896	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.004943 -0.157663	[MW] 119.7 RTE -0.000037 -0.004849 -0.00061 -0.002225 -0.158113 -0.153355 0.004905 -0.1577	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685 0.009755 -0.152851	[MW] [ 59.9 PSE 6 0.000023 0.000061 -0.004788 -0.002164 -0.158052 -0.153474 0.004966 -0.157639	[A]         [M]           1920         SE           0.002188         0           0.002225         0           -0.002624         0           0.002164         0           -0.155888         -0.15131           -0.15131         0           -0.07131         0	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.155888 0.004579 0.163019 0.000413	[kV]         [kV]           400         400           TEIAS         OST           0.153497         -0.00496           0.15353         -0.00490           0.146885         -0.00496           0.15131         -0.00131           -0.00579         -0.16301           -0.015404         -0.016301           -0.15844         -0.05405	[MVA] 0 1330.2 APG 3 0.157663 5 0.1577 5 0.152851 5 0.157639 1 0.155475 9 -0.000413 4 0.004165 0.162605 5	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907 -0.120982 -0.116403 0.042037	[MW] -156.7 HOPS -0.017173 -0.017173 -0.021985 -0.017197 -0.019361 -0.175249 -0.17067 -0.01223 -0.174836	IMW           7         0           MAVIR         0.161249           3         0.161286           5         0.161286           6         0.156437           7         0.161225           1         0.159061           9         0.003173           7         0.061925           5         0.0035865	F0 1 [MW] 1 -156.7 MEPSO 1 0.140554 0.140554 0.140554 0.140531 0.14592 -0.01522 -0.012943 0.145497 -0.01529	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217429 0.21258 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329	RAMnet 21 A (MW) [ 860.9 EMS E -0.012926 -0.012895 -0.01281 -0.015114 -0.17002 -0.0166424 -0.007983 -0.0170589	ANF 0 MWJ 0 0.2086 0.020898 0.016049 0.020837 0.018673 -0.137215 0.018673 0.018673 0.018673 0.018680	Fref' MW] -156.7 WPS 0.000024 0.000024 0.000024 -0.004788 -0.002164 -0.158052 -0.153473 0.004967 -0.157638	AAF 12 [MW] 0 NOSBIH 0.000759 0.000759 0.004053 0.000735 -0.001429 -0.157317 0.152739 0.005702 -0.156904	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002003 0.006582 0.165022 0.165022	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296	[MW] 860.9 CGES -0.000047 -0.004859 -0.000071 -0.002235 -0.158123 -0.153545 0.004896 -0.15771	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.15
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST APG ESO	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.004943 -0.157663 -0.037094	[MW] 119.7 RTE -0.000037 -0.004849 -0.00061 -0.002225 -0.158113 -0.153535 0.004905 -0.1577 -0.037132	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685 0.009755 -0.152851 -0.032282	[MW]         [           59.9         F           PSE         6           0.000023         0.00061           -0.004788         -           -0.002164         -           -0.158052         -           -0.153474         0.004966           -0.157639         -           -0.037071         -	[A]         [M]           1920         SE           0.002188         0           0.002225         0           -0.002624         0           0.002164         0           -0.155888         -0.15131           -0.15131         0           -0.07131         0	VVA] 1330.2 EPS 0.158076 0.158113 0.158126 0.158052 0.155888 0.004579 0.163019 0.000413 0.120982	(kV)         (kV)           400         0.40           TEIAS         OST           0.153497         -0.00494           0.153435         -0.00494           0.153435         -0.00494           0.153437         -0.00494           0.153447         -0.00494           0.15347         -0.00495           0.15347         -0.00496           -0.01457         -0.01584           -0.01584         -0.0584           -0.004165         -0.15260           0.116403         -0.04203	[MVA] 0 1330.2 APG 3 0.157663 5 0.1577 5 0.152851 5 0.157639 1 0.155475 9 -0.000413 4 0.004165 0.162605 5	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907 -0.120982 -0.116403 0.042037 -0.120568	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.01797 -0.019361 -0.175249 -0.17067 -0.01223 -0.174836 -0.054267	[MW] 7 0 MAVIR 8 0.161249 5 0.161249 5 0.156437 7 0.161225 1 0.159061 9 0.003173 7 0.007751 8 0.166192 5 0.003586 7 0.124154	F0 [ [MW] [ -156.7 MEPSO 1 0.140554 0.140554 0.140531 0.135742 0.135742 0.017522 -0.017522 -0.017108 0.145497 -0.017108	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.217368 0.217368 0.217368 0.217368 0.217368 0.217368 0.217368 0.217368 0.217368 0.059316 0.059	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.000071 -0.002235 -0.158123 -0.153545 0.004896 -0.15771	-0.00 -0.00 -0.00 -0.00 -0.01 -0.11 -0.11 -0.11 -0.11 -0.11 -0.11
	Critical outage	Cos Phi O PDTF from RTE TTN PSE REN SEPS TEIAS OST APG ESO HOPS MAVIR MEPSO	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.004943 -0.157663 -0.037094 0.017173 -0.161249	[MW] 119.7 RTE -0.00037 -0.004849 -0.000225 -0.158113 -0.153535 0.004905 -0.1577 -0.037132 0.017136 -0.161286	[MW] 59.9 TTN 0.004812 0.004849 0.004849 -0.004788 0.002624 -0.148685 0.009755 -0.148685 0.009755 -0.152851 -0.032282 0.021985 -0.156437	[MW]         [           59.9         9           PSE         0           0.000023         0           0.00041         -           -0.004788         -           -0.002164         -           -0.153632         -           -0.04788         -           -0.05474         0           0.004966         -           -0.157639         -           -0.037071         0           -0.161225         -	[A]         [M]           1920         SE           0.002188         0           0.00228         0           0.002624         0           0.002164         0           0.002164         0           0.002164         0           0.015181         0           0.015181         0           0.051547         0           0.055475         0           0.019561         0           0.019561         0	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.158052 0.155888 0.004579 0.163019 0.000413 0.120982 0.175249 0.003173	(kV)         (kV)           400         0.50           TEIAS         OST           0.153497         0.00494           0.135335         0.00490           0.136385         0.0075           0.131347         0.00496           0.131347         0.00496           0.131474         0.00496           0.131474         0.00496           0.154844         0.004165           0.016403         0.00205           0.017057         0.01620           0.007751         0.016619	[MVA] 1330.2 APG 0.157663 0.1577639 0.157759 0.052851 0.157459 0.00413 0.020413 0.020455 0.120568 0.127688 0.127868 0.1278588 0.127858 0.127858 0.127858 0.127858 0.127	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907 -0.120982 -0.116403 0.042037 -0.120568 0.054267 -0.124154	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197 -0.0179549 -0.17667 -0.17623 -0.174822 -0.054267	[MW] 7 0 MAVIR 3 0.161249 5 0.161226 5 0.156437 7 0.161225 1 0.159061 9 0.003173 7 0.007751 3 0.166192 5 0.00356 7 0.124154 0.178422	F0 [ [MW] - -156.7 MEPSO - 0.140554 0.140552 0.135742 0.135742 0.135742 0.135742 0.135743 0.135867 -0.017522 -0.012943 0.145497 -0.017108 0.103749 -0.017108 0.157749 -0.017108 -0.017279 -0.0187749 -0.017749 -0.001749	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 / (MW) [ 860.9 EMS E -0.012926 -0.012889 -0.01738 -0.015114 -0.171002 -0.166424 -0.017983 -0.017089 -0.015021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.15
	Critical outage	Cos Phi 0 PDT from RTE TTN PSE REN SEPS SEPS SEO HOPS MAVIR MEPSO Transelectrica	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.004943 -0.157663 -0.037094 0.017173 -0.037094 -0.140554	[MW] 119.7 RTE -0.00037 -0.004849 -0.00225 -0.158113 -0.153535 0.004905 -0.1577 -0.037132 0.017136 -0.161286 -0.140592	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.154865 -0.154865 -0.154865 -0.05255 -0.152821 0.021985 -0.156437 -0.135742	[MW]         [I]           59.9         9           0.000023         0.00061           -0.002164         -0.158052           -0.153474         0.004966           -0.057639         -0.037071           -0.017197         -0.017197           -0.014225         -0.140531	[A]         [M]           1920         SE           0.002188         0           0.00228         0           0.002028         0           0.002184         0           0.002024         0           0.002188         0           0.002184         0           0.002164         0           0.002164         0           0.002164         0           0.002164         0           0.002164         0           0.002164         0           0.007131         0           0.015361         0           0.019361         0           0.019361         0           0.019364         0           0.15388         0	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.158052 0.155888 0.004579 0.163019 0.000413 0.120982 0.175249 0.003173 0.017522	[kV]         [kV]           400         400           153497         0.00494           0.153497         0.00494           0.153353         0.00495           0.153474         0.00496           0.15313         0.00751           0.153474         0.00496           0.15313         0.00731           0.004513         0.00731           0.15844         -0.1584           0.15845         0.15260           0.116403         0.04203           0.116403         0.04203           0.00757         0.01224           0.00245         0.15464	[MVA] 1330.2 APG 0.157653 0.157653 0.157653 0.1528513 0.1528513 0.1528513 0.1528513 0.1528513 0.1528513 0.1528513 0.1528563 0.004133 0.004135 0.1520568 0.174836 0.017108	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.034907 -0.120982 -0.116403 0.042037 -0.120568 0.054267 -0.124154 -0.10346	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197 -0.019361 -0.175249 -0.17067 -0.01223 -0.174836 -0.054267 -0.054267 -0.178422 -0.1778422 -0.157727	[MW] 7 0 MAVIR 3 0.161249 5 0.161249 5 0.161286 5 0.156437 7 0.161225 1 0.159061 9 0.003173 7 0.007751 3 0.166192 5 0.003586 7 0.124154 0.178422 2 7 0.020694	F0 F	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.12285	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.15
	Critical outage	Cos Phi 0 PDTF from RTE TTN PPE REN SEPS TEIAS OST APG ESO HOPS MAVIR MEPSO	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.158076 -0.157663 -0.037094 0.017773 -0.161249 -0.140554 -0.217392	[MW] 119.7 RTE -0.000037 -0.0004849 -0.000261 -0.00225 -0.158113 -0.153535 0.004905 -0.1577 -0.037132 0.017136 -0.161286 -0.140592 -0.217429	[MW] 59.9 TTN 0.004812 0.004849 0.002624 -0.153264 -0.153264 -0.148685 0.009755 -0.152851 -0.021985 -0.021985 -0.156437 -0.135742 -0.21258	[MW]         [I]           59.9         9           95E         8           0.000023         0.00061           -0.002164         -0.158052           -0.158052         -0.153474           0.004966         -0.157639           -0.03711         -0.017197           -0.161225         -0.140531           -0.217368         -0.217368	[A]         [M]           1920         SE           0.002184         0.002255           0.002255         0.002254           0.0022164         0.00           0.002164         0.00           0.001184         0.00           0.002164         0.00           0.015181         0.00           0.015181         0.007131           0.0151847         0.00           0.015961         0.013806           0.013806         0.038807           0.0138047         0.038807	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.158052 0.155888 0.004579 0.0004579 0.163019 0.000413 0.120982 0.175249 0.003173 0.017522 0.059316	[kV]         [kV]           400         400           TEIAS         OST           0.153435         -0.0494           0.153535         -0.0490           0.153345         -0.04975           0.15131         -0.0015           0.15134         -0.0494           0.05457         -0.16301           0.15484         -0.0493           0.040455         -0.16260           0.17067         0.0122           0.070751         0.06193           0.012943         -0.04293	[MVA] 1330.2 APG 0.157653 0.157653 0.157659 0.152515 0.152659 0.000413 0.004165 0.162605 0.162605 0.125688 0.174366 0.017108 0.017108 0.0059729	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.037071 0.034007 -0.120982 -0.116403 0.042037 -0.120568 0.054267 -0.124154 -0.10346 -0.180298	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.017197 -0.017937 -0.01795 -0.175249 -0.17667 -0.01223 -0.17436 -0.05727 -0.234565	[MW] 7 0 MAVIR 3 0.161249 5 0.161249 5 0.161286 5 0.156437 7 0.161225 1 0.159061 9 0.003173 7 0.007751 3 0.166192 5 0.003586 7 0.124154 0.02586 7 0.124154 0.02694 5 0.02694 5 0.056143	F0 II [MW] I -156.7 MEPSO 0 0.140554 0.140552 0.135742 0.140531 0.138367 -0.017522 -0.017522 -0.012943 0.135497 -0.017108 0.10346 0.10346 0.10346 0.103772 -0.109 Br. File V -0.	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.000478 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.12285	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.15
	Critical outage	Cos Phi O PDTF from RTE RTN PSE REN SEPS TEIAS OST APG ESO HOPS MAVIR MEPSO Transelectrica EMS	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.004943 -0.157663 -0.037094 0.017173 -0.161249 -0.140554 -0.217392 0.012926	[MW] 119.7 RTE -0.000037 -0.004849 -0.000225 -0.158113 -0.153535 0.004905 -0.1577 -0.037132 0.017136 -0.161289 -0.140592 -0.217429 0.012889	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.152851 -0.032282 0.021925 -0.156377 -0.154372 -0.154372 -0.154372 -0.154372	[MW]         [           59.9         9           PSE         0           0.000061         0           -0.04788         0           -0.02164         -           -0.158052         -           -0.158054         -           -0.04788         -           -0.057639         -           -0.017197         -           -0.140531         -           -0.123688         -           0.01295         -	(A)         (M)           1920         SE           0.002188         0           0.002252         0           0.002264         0           0.002164         0           0.002184         0           0.002184         0           0.002184         0           0.002184         0           0.015131         0           0.015131         0           0.019361         0           0.019361         0           0.019361         0           0.131367         0           0.131367         0           0.215244         0	VVA] 1330.2 EPS 0.158076 0.158113 0.153264 0.158052 0.155888 0.004579 0.000413 0.120982 0.175249 0.003173 0.017522 0.059316 0.171002	[kV]         [kV]           400         400           153497         0.00494           0.153497         0.00494           0.153353         0.00495           0.153474         0.00496           0.15313         0.00751           0.153474         0.00496           0.15313         0.00731           0.004513         0.00731           0.15844         -0.1584           0.15845         0.15260           0.116403         0.04203           0.116403         0.04203           0.00757         0.01224           0.00245         0.15464	[MVA] 1330.2 APG 3 0.157663 5 0.1577 0 0.15275 9 0.000413 4 0.004155 0 0.162605 5 7 0.120568 8 0.174836 2 0.003586 7 0.012108	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.037071 0.034007 -0.120982 -0.116403 0.042037 -0.120568 0.054267 -0.124154 -0.10346 -0.180298	[MW] -156.7 HOPS -0.017173 -0.017136 -0.021985 -0.01797 -0.019361 -0.175249 -0.17667 -0.01223 -0.174836 -0.054267 -0.178422 -0.157727 -0.234565 -0.004247	[MW] 7 0 MAVIR 8 0.161249 5 0.161249 5 0.161265 5 0.1526437 7 0.161225 1 0.159061 9 0.003173 7 0.000751 8 0.166192 5 0.003586 7 0.124154 0.178422 2 7 0.020694 5 -0.056143 7 0.174175	F0 I [MW] I -156.7 MEPSO 1 0.140554 0.140592 0.135742 0.140531 0.0138367 -0.017522 -0.012943 0.145497 -0.017108 0.10346 0.10346 0.10346 0.10346 0.10346 0.10546 0.10546 0.10546 0.10546 0.10546 0.10546 0.10546 0.10554 0.105555 0.105555 0.105555 0.105555 0.105555 0.1055555 0.1055555 0.1055555 0.1055555555555 0.1055555555555555555555555555555555555	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.000478 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.12285	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.15
	Critical outage	Cos Phi O PDTF from RTE RTN PSE REN SFPS TELAS OST APG ESO HOPS MAVIR MEPSO Transelectrica ELS WPS NOSBIH	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.157633 -0.037094 0.017173 -0.157663 -0.037094 0.0177392 -0.12266 -0.02266 -0.000024	[MW] 119.7 RTE -0.000037 -0.004849 -0.00225 -0.158113 -0.153535 0.04905 -0.1577 -0.037132 0.017136 -0.161286 -0.140592 -0.217429 -0.220898 -0.020898 -0.00062	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.153264 -0.152851 -0.021985 -0.21285 -0.21258 0.0156437 -0.21258 0.0135742 -0.21258 0.013742 -0.21258	[MW]         [           59.9         PSE         0           0.00003         0         0           0.00047         0         0           -0.004788         -         -           -0.004788         -         -           -0.0158052         -         0.158052           -0.158052         -         0.157639           -0.037171         -         0.017197           -0.015125         -         0.140531           -0.17388         -         0.21388           -0.21385         -         0.202837           -0.020837         -         0.00001	(A)         (M)           1920         SE           0.002188         0.002184           0.002182         0           0.002252         0           0.002184         0           0.002185         0           0.002183         0           0.007131         0           0.003181         0           0.015475         0           0.034907         0           0.158076         0           0.158076         0           0.158076         0           0.158076         0           0.158076         0           0.158076         0           0.158076         0           0.158076         0           0.021544         0           0.013914         0           0.012154         0	VVA] 1330.2 EPS 0.158076 0.158018 0.158018 0.153264 0.153264 0.153264 0.0004579 0.0004579 0.0004579 0.0004579 0.000413 0.120982 0.003173 0.017522 0.059316 0.175225 0.158052	[kv]         [kv]           400         400           TEIAS         OST           0.153437         -0.00494           0.153335         -0.0490           0.153435         -0.04904           0.153131         -0.00151           0.15131         -0.01524           0.151341         -0.04054           0.154043         -0.0203           0.154043         -0.0203           0.151431         -0.0203           0.07751         -0.16140           0.012434         -0.02034           0.053845         -0.2233           0.16404         -0.0234           0.012434         -0.04265           0.126424         -0.07848           0.132637         -0.05485	[MVA]           1330.2           APG           3         0.157663           0.157763           0.15775           0.155775           0.004155           0.162605           7           0.120568           0.157708           0.1400000000000000000000000000000000000	[MW] 1197.2 ESO 0.037094 0.037132 0.032282 0.037071 0.032492 -0.120982 -0.120982 -0.120568 0.054267 -0.124154 -0.10346 -0.10346 -0.10346 0.05021 0.05021 0.05021 0.05023 0.05023 0.05023 0.05023 0.05023 0.05023 0.05023 0.05023 0.05023 0.05023 0.05023 0.05025 0.0505 0.05055 0.05055 0.05055 0.05055 0.05055 0.05055 0.050555 0.0	[MW] -156.7 HOPS -0.017173 -0.017136 -0.017197 -0.019361 -0.175249 -0.17657 -0.01223 -0.178422 -0.178422 -0.178422 -0.178422 -0.178422 -0.178422 -0.178422 -0.038034 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.038034 -0.017197 -0.017197 -0.017197 -0.017197 -0.017197 -0.01723 -0.01723 -0.01723 -0.01723 -0.01785 -0.01797 -0.01795 -0.0044 -0.00447 -0.0047 -0.0047 -0.0047 -0.0047 -0.0047 -0.0047 -0.0047 -0.	[MW] 7 0 MAVIR 3 0.161249 5 0.161249 5 0.161249 5 0.161225 1 0.159061 9 0.003173 7 0.001751 8 0.166192 5 0.003586 7 0.124154 0.020694 5 -0.056143 7 0.124174 5 -0.056143 7 0.124174 5 -0.056143 7 0.12428 6 -0.12438 7 0.161224	F0 [MW] -156.7 MEPSO 0.140554 0.140554 0.140554 0.140554 0.140531 0.138367 -0.012943 0.138367 -0.012943 0.10346 0.10346 0.10346 0.10346 0.10346 0.10346 0.10346 0.10346 0.10570 File V -0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.000478 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.12285	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.03
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST APG ESO HOPS MAVIR MEPSO Transelectrica EMS WPS NOSBIH TEINA	[MW] 119.7 o 0.000037 -0.004812 -0.000238 -0.0158076 -0.153497 0.004943 -0.157663 -0.037094 0.015763 -0.037094 -0.161249 -0.140554 -0.217392 0.012926 -0.020286 -0.000024 -0.0000759	[MW] 119.7 RTE -0.00037 -0.004849 -0.00061 -0.02225 -0.158113 -0.015813 -0.01587 -0.1577 -0.037132 0.017136 -0.161286 -0.140592 -0.227429 0.012889 -0.020898 -0.020059	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.153264 -0.153265 -0.152851 -0.021985 -0.155437 -0.35742 -0.21258 0.01778 -0.016049 -0.016049 -0.016494 0.004788 0.004788	[MW]         [           59.9         9           PSE         0           0.00023         0           0.00124         -           -0.02164         -           -0.158374         -           0.037071         -           0.017197         -           -0.1576389         -           -0.127638         -           -0.202377         -           -0.0020837         -           -0.0000735         -	(A)         (M)           1920         SE           REN         SE           0.002188         O           0.00225         0           0.00226         0           0.00228         0           0.00264         0           0.002164         0           0.002164         0           0.002164         0           0.002164         0           0.0017131         0           0.0153810         0           0.019361         0           0.019361         0           0.215204         0           0.015114         0           0.015141         0           0.015141         0           0.015141         0           0.015141         0           0.015141         0           0.002164         0           0.002164         0	VVA] 1330.2 EPS 0.158076 0.158013 0.158052 0.155888 0.004579 0.000413 0.0004579 0.000413 0.000413 0.0120982 0.120982 0.120982 0.0120982 0.	[kV]         [kV]           400         400           401         607           0.153497         0.00494           0.153497         0.00494           0.153497         0.00494           0.153474         0.00495           0.153474         0.00495           0.00579         0.15347           0.004579         0.15204           0.016402         0.04203           0.10767         0.0122           0.00751         0.16512           0.005395         0.02598           0.166424         0.00786           0.166427         0.02580           0.154347         0.00580           0.154347         0.02580           0.154347         0.00580	[MVA] 1330.2 APG 0.15763 0.157639 0.152851 0.152851 0.152851 0.152851 0.152851 0.152851 0.152851 0.152852 0.0004185 0.120568 0.120568 0.120568 0.174836 0.003586 0.003586 0.003586 0.003586 0.003586 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.120568 0.170599 0.17059 0.	[MW] 1197.2 ESO 0.037094 0.037192 0.037092 0.032282 0.037071 0.034907 -0.120982 -0.116403 0.042037 -0.120568 0.054267 -0.124154 -0.10346 -0.180298 0.050021 0.016234 0.036336	[MW] -156.7 HOPS -0.017133 -0.017133 -0.017135 -0.017137 -0.019351 -0.17047 -0.01223 -0.174836 -0.054267 -0.054267 -0.178422 -0.157727 -0.234565 -0.004247 -0.038034 -0.017932 -0.017932	[MW] 7 0 MAVIR 9 0.161249 5 0.161249 5 0.161249 5 0.15437 7 0.161225 1 0.159061 9 0.003173 7 0.007751 8 0.166192 5 0.003586 7 0.124154 0.178422 2 7 0.020694 5 -0.056143 7 0.124154 5 -0.056143 7 0.124154 5 -0.056143 7 0.161428 7 0.161428	F0 [ [MW] -156.7 MEPSO 1 0.140554 0.140554 0.140554 0.140552 0.140531 0.135742 0.140531 0.138467 -0.017522 -0.012943 0.145497 -0.012943 0.10346 0.10346 0.10346 0.10346 0.1000 0. 0. 0. 0. 0. 0. 0. 0. 0.	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.000478 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.12285	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.03
	Critical outage	Cos Phi PDTF from RTE RTN PSE REN SSFS SSFS COST APG ESO HOPS MAVIR MEPSO MAVIR MEPSO MESSO HOPS ELES NOSBIH TERNA IERNA IERNA	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.153497 -0.153497 -0.153497 -0.153497 -0.04943 -0.157663 -0.037094 0.0157663 -0.015292 0.012926 -0.02086 -0.00079 -0.00079 -0.160079	[MW] 119.7 RTE -0.00037 -0.004849 -0.00061 -0.02225 -0.05213 -0.153535 0.004905 -0.15373 -0.1577 -0.037132 0.017136 -0.161286 -0.161289 -0.217429 0.021889 -0.220898 -0.00076 -0.00078 -0.00078 -0.00061 -0.00078 -0.00078 -0.00061 -0.00061 -0.00061 -0.00061 -0.00061 -0.00078 -0.00078 -0.0004905 -0.00776 -0.0078 -0.0078 -0.0018	[MW] 59.9 TTN 0.004812 0.004849 0.002624 -0.153264 -0.153264 -0.153264 -0.152851 -0.152851 -0.152851 -0.152851 -0.156437 -0.21258 0.017738 -0.017738 -0.017738 -0.04049 0.004788 0.0040788 -0.045267	[MW]         [0           59.9         PSE         0           0.00023         0.000061         0           -0.004788         0         0           -0.002164         -0.158052         0           -0.0158052         0.004966         0           -0.0157639         -0.037071         0           -0.017197         -0.161225         -0.40531           -0.217688         -0.020837         -0.0020837           -0.0020837         -0.000035         -0.000055	(A)         (M)           1920         SE           0.002188         0.002182           0.002182         0           0.002225         0           0.002164         0           0.002184         0           0.002185         0           0.001181         0           0.007131         0           0.0155475         0           0.0155475         0           0.0155475         0           0.0155475         0           0.0159601         0           0.1559061         0           0.215204         0           0.015140         0           0.015147         0           0.015140         0           0.015141         0           0.015145         0           0.015140         0           0.015147         0           0.015147         0           0.015147         0           0.015147         0           0.015147         0           0.015147         0           0.015147         0           0.015147         0           0.015147         0	VVA] 1330.2 EPS 0.158076 0.158076 0.158105 0.1581052 0.155888 0.004579 0.163019 0.000413 0.120982 0.17299 0.003173 0.0059316 0.171002 0.157817 0.158052 0.157817 0.02003	[kV]         [kV]           400         400           TEIAS         OST           0.153497         -0.00490           0.153355         -0.00975           0.153435         -0.00490           0.15343         -0.00490           0.15314         -0.00450           0.15314         -0.00455           0.15404         -0.00455           0.15405         -0.15240           0.107067         0.0122           0.012445         0.15426           0.012454         0.14549           0.012454         0.15426           0.132637         -0.02458           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.03528         -0.03582	[MVA] APG 0.137063 0.157763 0.152851 0.15775 0.152851 0.15779 0.000413 0.000413 0.004155 0.152655 0.152688 0.0170886 0.017108 0.017089 0.0127688 0.0170886 0.017108 0.0170886 0.017108 0.0155638 0.015648 0.017188 0.015648 0.017648 0.015568 0.017188 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.017688 0.015688 0.017688 0.017688 0.015688 0.017688 0.015688 0.017688 0.0156888 0.0156888 0.015688 0.015688	[MW] 1197.2 ESO 0.037094 0.037132 0.037071 0.032082 0.034007 0.120982 -0.116403 0.042037 -0.120568 0.054267 -0.124154 -0.180298 0.050021 0.036336 -0.182985 -0.122985	[MW] -156.7 HOPS -0.01713 -0.017136 -0.021985 -0.017136 -0.01985 -0.017926 -0.17067 -0.01223 -0.174826 -0.178422 -0.157727 -0.054267 -0.054257 -0.054257 -0.054257 -0.054257 -0.05427 -0.054257 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.054557 -0.05557 -0.05557 -0.055577 -0.055577 -0.055577 -0.0555777 -0.05557777 -0.05557777 -0.0555777777777777777777777777777777777	[MW] 7 0 MAVIR 5 0.161249 5 0.161249 5 0.161286 5 0.156437 7 0.161225 9 0.003173 7 0.007751 8 0.166192 5 0.003786 7 0.124154 9 0.003173 7 0.020694 5 0.056143 7 0.124145 7 0.174175 4 0.140388 7 0.161224 2 0.160492 9 0.00117	F0 [MW] -156.7 MEPSO 0.140554 0.140554 0.140592 0.1405742 0.140592 0.140593 0.145497 -0.01728 0.10346 0.10346 0.10346 0.10346 0.10376 0.10577 -0.017108 0.105777 -0.017108 0.105777 -0.017108 0.105777 -0.017108 0.105777 -0.017108 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MWJ -156.7 WPS 0.000024 0.000062 -0.000478 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.03
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST APG ESO HOPS MAVIR MEPSO Transelectrica EMS WPS NOSBIH TEINA	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.04943 -0.157663 -0.37094 0.017173 -0.161249 -0.40554 -0.217392 -0.12926 -0.02086 -0.00024 -0.02086 -0.000024 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.000	[MW] 119.7 RTE -0.00037 -0.004849 -0.000225 -0.05213 -0.153535 0.004905 -0.1537 -0.037132 -0.037132 -0.037132 -0.037132 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.020898 -0.00062 -0.020898 -0.00062 -0.000766 -0.148404	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685 0.009755 -0.152851 -0.032282 0.021985 -0.156437 -0.315742 -0.21258 0.016049 0.004788 0.004788 0.004788 -0.016049 0.004788 -0.155267 -0.143555	[MW]         [0           59.9         PSE         0           0.00023         0         0           0.00013         -         0           -0.01748         -         0           -0.02164         -         0.158052           -0.037071         0         0.04966           -0.157639         -         0.041975           -0.161225         -         0.140531           -0.21368         0         0.02987           -0.000001         -         0.00735           -0.160255         -         0.160055           -0.000031         -         0.000031           -0.000031         -         0.000035           -0.161255         -         0.164344	(A)         (M)           1920         REN         SE           REN         0.002188         0.002255         0.002025           -0.002624         0.002024         0.002164         0.002164           0.002164         0.002164         0.001315         0.001315           0.007131         0.0151361         0.001345         0.001345           0.0139361         0.019361         0.019361         0.019361           0.0139361         0.0133867         0.0133867         0.0133867           0.0121544         0.0139361         0.012164         0.013181           0.0121541         0.0012164         0.0012164         0.0012164           0.0012164         0.0012164         0.0137781         0.0147197           0.0145718         0.0146179         0.0146179         0.0146179	WVA) 1330.2 PP 0.158076 0.158076 0.158076 0.158072 0.158072 0.158072 0.158082 0.0158022 0.004579 0.004579 0.004579 0.004579 0.004579 0.004579 0.004579 0.004579 0.004579 0.004579 0.004579 0.017522 0.017522 0.017522 0.017522 0.017522 0.017522 0.017522 0.017522 0.017522 0.015737 0.015737 0.00203	[kV]         [kV]           400         400           TEIAS         OST           0.153497         -0.00490           0.153355         -0.00975           0.153435         -0.00490           0.15343         -0.00490           0.15314         -0.00450           0.15314         -0.00455           0.15404         -0.00455           0.15405         -0.15240           0.107067         0.0122           0.012445         0.15426           0.012454         0.14549           0.012454         0.15426           0.132637         -0.02458           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.132637         -0.02496           0.03528         -0.03582	[MVA] and a second sec	[MW] 1197.2 ESO 0.037094 0.037132 0.03282 0.037071 0.03282 0.037071 0.03282 0.037071 0.120982 0.042037 -0.120568 0.054267 -0.124154 -0.180298 0.0504264 0.050298 0.050636 -0.180298 0.050636 -0.122985 -0.11273	[MW] -156.7 HOPS -0.017136 -0.017137 -0.017137 -0.017936 -0.017524 -0.175244 -0.175244 -0.178426 -0.054267 -0.054267 -0.054267 -0.054267 -0.054267 -0.038034 -0.017932 -0.177932 -0.17554	[MW]           7         0           MAVIR         0.161249           5         0.156437           7         0.0031737           0         0.0031737           0         0.0031737           0         0.0031737           0         0.016132           0         0.06132           0         0.06132           7         0.020543           7         0.020543           7         0.174125           0         0.161322           2         0.160492           7         0.160492           0         0.161224           0         0.161242           0         0.161242           0         0.161242           0         0.01274775           0         0.01274775           0         0.01274775	F0 [MW] [MW] -156.7 MEPS0 1 0.140592 0.140592 0.140592 0.135742 0.140592 0.017522 -0.017108 0.10346	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.03
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST TEIAS OST APG ESO HOPS MAVIR MEPSO Transelectrica EMS ELES WPS NOSBIH TERNA IFTNA IFTNA	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.04943 -0.157663 -0.37094 0.017173 -0.161249 -0.40554 -0.217392 -0.12926 -0.02086 -0.00024 -0.02086 -0.000024 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.000	[MW] 119.7 RTE -0.00037 -0.004849 -0.000225 -0.05213 -0.153535 0.004905 -0.1537 -0.037132 -0.037132 -0.037132 -0.037132 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.020898 -0.00062 -0.020898 -0.00062 -0.000766 -0.148404	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685 0.009755 -0.152851 -0.032282 0.021985 -0.156437 -0.315742 -0.21258 0.016049 0.004788 0.004788 0.004788 -0.016049 0.004788 -0.155267 -0.143555	[MW]         [0           59.9         PSE         0           0.00023         0         0           0.00013         -         0           -0.01748         -         0           -0.02164         -         0.158052           -0.037071         0         0.04966           -0.157639         -         0.041975           -0.161225         -         0.140531           -0.21368         0         0.02987           -0.000001         -         0.00735           -0.160255         -         0.160055           -0.000031         -         0.000031           -0.000031         -         0.000035           -0.161255         -         0.164344	(A)         (M)           1920         REN         SE           REN         0.002188         0.002255         0.002025           -0.002624         0.002024         0.002164         0.002164           0.002164         0.002164         0.001315         0.001315           0.007131         0.0151361         0.001345         0.001345           0.0139361         0.019361         0.019361         0.019361           0.0139361         0.0133867         0.0133867         0.0133867           0.0121544         0.0139361         0.012164         0.013181           0.0121541         0.0012164         0.0012164         0.0012164           0.0012164         0.0012164         0.0137781         0.0147197           0.0145718         0.0146179         0.0146179         0.0146179	WVA) 1330.2 PP 0.158076 0.158076 0.158076 0.158072 0.158072 0.158072 0.158082 0.0158022 0.004579 0.004579 0.004579 0.004579 0.004573 0.004573 0.017522 0.015727 0.015727 0.017522 0.015727 0.015727 0.00203 0.002	(kv)         (kv)           400         0.0044           0.15347         0.00494           0.15353         0.00490           0.15347         0.00496           0.15347         0.00496           0.15347         0.00496           0.15131         0.0073           0.15131         0.0075           0.15448         0.0025           0.01544         0.0025           0.01751         0.01619           0.17067         0.0122           0.007751         0.01619           0.12443         0.42433           0.15444         0.00298           0.17057         0.01261           0.17057         0.01261           0.12443         0.42433           0.15444         0.02798           0.15273         0.02584           0.153473         0.04965           0.153473         0.04965           0.153473         0.04956           0.05154         0.0518	[MVA] and a second sec	[MW] 1197.2 ESO 0.037094 0.037132 0.03282 0.037071 0.03282 0.037071 0.03282 0.037071 0.120982 0.042037 -0.120568 0.054267 -0.124154 -0.180298 0.0504264 0.050298 0.050636 -0.180298 0.050636 -0.122985 -0.11273	[MW] -156.7 HOPS -0.017136 -0.017137 -0.017137 -0.017936 -0.017524 -0.175244 -0.175244 -0.178426 -0.054267 -0.054267 -0.054267 -0.054267 -0.054267 -0.038034 -0.017932 -0.177932 -0.17554	[MW] 7 0 MAVIR 5 0.161249 5 0.161249 5 0.161286 5 0.156437 7 0.161225 9 0.003173 7 0.007751 8 0.166192 5 0.003786 7 0.124154 9 0.003173 7 0.020694 5 0.056143 7 0.124145 7 0.174175 4 0.140388 7 0.161224 2 0.160492 9 0.00117	F0 [MW] [MW] -156.7 MEPS0 1 0.140554 0.140554 0.140554 0.140531 0.135742 -0.017522 -0.012943 0.01546 0.1036 0.1036 0.1006 0	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.15
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST TEIAS OST APG ESO HOPS MAVIR MEPSO Transelectrica EMS ELES WPS NOSBIH TERNA IFTNA IFTNA	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.04943 -0.157663 -0.37094 0.017173 -0.161249 -0.40554 -0.217392 -0.12926 -0.02086 -0.00024 -0.02086 -0.000024 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.000	[MW] 119.7 RTE -0.00037 -0.004849 -0.000225 -0.05213 -0.153535 0.004905 -0.1537 -0.037132 -0.037132 -0.037132 -0.037132 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.020898 -0.00062 -0.020898 -0.00062 -0.000766 -0.148404	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685 0.009755 -0.152851 -0.032282 0.021985 -0.156437 -0.315742 -0.21258 0.016049 0.004788 0.004788 0.004788 -0.016049 0.004788 -0.155267 -0.143555	[MW]         [0           59.9         PSE         0           0.00023         0         0           0.00013         -         0           -0.01748         -         0           -0.02164         -         0.158052           -0.037071         0         0.04966           -0.157639         -         0.041975           -0.161225         -         0.140531           -0.21368         0         0.02987           -0.000001         -         0.00735           -0.160255         -         0.160055           -0.000031         -         0.000031           -0.000031         -         0.000035           -0.161255         -         0.164344	(A)         (M)           1920         REN         SE           REN         0.002188         0.002255         0.002025           -0.002624         0.002024         0.002164         0.002164           0.002164         0.002164         0.001315         0.001315           0.007131         0.0151361         0.001345         0.001345           0.0139361         0.019361         0.019361         0.019361           0.0139361         0.0133867         0.0133867         0.0133867           0.0121544         0.0139361         0.012164         0.013181           0.0121541         0.0012164         0.0012164         0.0012164           0.0012164         0.0012164         0.0137781         0.0147197           0.0145718         0.0146179         0.0146179         0.0146179	WVA) 1330.2 PP 0.158076 0.158076 0.158076 0.158072 0.158072 0.158072 0.158082 0.0158022 0.004579 0.004579 0.004579 0.004579 0.004573 0.004573 0.017522 0.015727 0.015727 0.017522 0.015727 0.015727 0.00203 0.002	(kv)         (kv)           400         0.0044           0.15347         0.00494           0.15353         0.00490           0.15347         0.00496           0.15347         0.00496           0.15347         0.00496           0.15131         0.0073           0.15131         0.0075           0.15448         0.0025           0.01544         0.0025           0.01751         0.01619           0.17067         0.0122           0.007751         0.01619           0.12443         0.42433           0.15444         0.00298           0.17057         0.01261           0.17057         0.01261           0.12443         0.42433           0.15444         0.02798           0.15273         0.02584           0.153473         0.04965           0.153473         0.04965           0.153473         0.04956           0.05154         0.0518	[MVA] and a second sec	[MW] 1197.2 ESO 0.037094 0.037132 0.03282 0.037071 0.03282 0.037071 0.03282 0.037071 0.120982 0.042037 -0.120568 0.054267 -0.124154 -0.180298 0.0504264 0.050298 0.050636 -0.180298 0.050636 -0.122985 -0.11273	[MW] -156.7 HOPS -0.017136 -0.017137 -0.017137 -0.017936 -0.017524 -0.175244 -0.175244 -0.178426 -0.054267 -0.054267 -0.054267 -0.054267 -0.054267 -0.038034 -0.017932 -0.177932 -0.17554	[MW]           7         0           MAVIR         0.161249           5         0.156437           7         0.0031737           0         0.0031737           0         0.0031737           0         0.0031737           0         0.016132           0         0.06132           0         0.06132           7         0.020543           7         0.020543           7         0.174125           0         0.161322           2         0.160492           7         0.160492           0         0.161224           0         0.161242           0         0.161242           0         0.161242           0         0.01274775           0         0.01274775           0         0.01274775	F0 1 [MW] -156.7 MEPS0 1 0.140554 0.140554 0.140554 0.140592 0.135742 0.0135742 -0.0172043 0.013546 0.012943 0.012943 0.012943 0.012943 0.012943 0.012943 0.012943 0.012943 0.012943 0.01596 0.01596 0.01596 0.01596 0.01596 0.01596 0.01596 0.01596 0.01596 0.01597 -0.017108 0.016956 0.01597 -0.017108 0.01597 -0.017108 0.01597 -0.017108 0.01597 -0.017108 0.01597 -0.017108 -0.01708 -0.0	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.03
	Critical outage	Cos Phi 0 PDTF from RTE TTN PSE REN SEPS TEIAS OST TEIAS OST APG ESO HOPS MAVIR MEPSO Transelectrica EMS ELES WPS NOSBIH TERNA IFTNA IFTNA	[MW] 119.7 o 0.000037 -0.004812 -0.00023 -0.002188 -0.158076 -0.153497 0.04943 -0.157663 -0.37094 0.017173 -0.161249 -0.40554 -0.217392 -0.12926 -0.02086 -0.00024 -0.02086 -0.000024 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000025 -0.000005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.00005 -0.000	[MW] 119.7 RTE -0.00037 -0.004849 -0.000225 -0.05213 -0.153535 0.004905 -0.1537 -0.037132 -0.037132 -0.037132 -0.037132 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.037142 -0.020898 -0.00062 -0.020898 -0.00062 -0.000766 -0.148404	[MW] 59.9 TTN 0.004812 0.004849 0.004788 0.002624 -0.153264 -0.148685 0.009755 -0.152851 -0.032282 0.021985 -0.156437 -0.315742 -0.21258 0.016049 0.004788 0.004788 0.004788 -0.016049 0.004788 -0.155267 -0.143555	[MW]         [0           59.9         PSE         0           0.00023         0         0           0.00013         -         0           -0.0148         -         0           -0.02164         -         0           -0.037071         0         0           -0.0140531         -         0.161225           -0.140531         -         0.012987           -0.0208377         -         0.0020837           -0.000001         -         0.00735           -0.161225         -         0.164344	(A)         (M)           1920         REN         SE           REN         0.002188         0.002255         0.002025           -0.002624         0.002024         0.002164         0.002164           0.002164         0.002164         0.001315         0.001315           0.007131         0.0151361         0.001345         0.001345           0.0139361         0.019361         0.019361         0.019361           0.0139361         0.0133867         0.0133867         0.0133867           0.0121544         0.0139361         0.012164         0.013181           0.0121541         0.0012164         0.0012164         0.0012164           0.0012164         0.0012164         0.0137781         0.0147197           0.0145718         0.0146179         0.0146179         0.0146179	WVA) 1330.2 PP 0.158076 0.158076 0.158076 0.158072 0.158072 0.158072 0.158082 0.0158022 0.004579 0.004579 0.004579 0.004579 0.004573 0.004573 0.017522 0.015727 0.015727 0.017522 0.015727 0.015727 0.00203 0.002	(kv)         (kv)           400         0.0044           0.15347         0.00494           0.15353         0.00490           0.15347         0.00496           0.15347         0.00496           0.15347         0.00496           0.15131         0.0073           0.15131         0.0075           0.15448         0.0025           0.01544         0.0025           0.01751         0.01619           0.17067         0.0122           0.007751         0.01619           0.12443         0.42433           0.15444         0.00298           0.17057         0.01261           0.17057         0.01261           0.12443         0.42433           0.15444         0.02798           0.15273         0.02584           0.153473         0.04965           0.153473         0.04965           0.153473         0.04956           0.05154         0.0518	[MVA] and a second sec	[MW] 1197.2 ESO 0.037094 0.037132 0.03282 0.037071 0.03282 0.037071 0.03282 0.037071 0.120982 0.042037 -0.120568 0.054267 -0.124154 -0.180298 0.0504264 0.050298 0.050636 -0.180298 0.050636 -0.122985 -0.11273	[MW] -156.7 HOPS -0.017136 -0.017137 -0.017137 -0.017936 -0.017524 -0.175244 -0.175244 -0.178426 -0.054267 -0.054267 -0.054267 -0.054267 -0.054267 -0.038034 -0.017932 -0.177932 -0.17554	[MW]           7         0           MAVIR         0.161249           5         0.156437           7         0.0031737           0         0.0031737           0         0.0031737           0         0.0031737           0         0.016132           0         0.06132           0         0.06132           7         0.020543           7         0.020543           7         0.174125           0         0.161322           2         0.160492           7         0.160492           0         0.161224           0         0.161242           0         0.161242           0         0.161242           0         0.01274775           0         0.01274775           0         0.01274775	F0 [MW] [MW] -156.7 MEPS0 1 0.140554 0.140554 0.140554 0.140531 0.135742 -0.017522 -0.012943 0.01546 0.1036 0.1036 0.1006 0	RAMnet 12 [MW] 1174.3 Transelectr 0.217392 0.217368 0.217368 0.215204 0.059316 0.059316 0.059316 0.059329 0.222335 0.059729 0.180298 0.324555 anch XPF	RAMnet 21 A (MW) [ B60.9 EMS E -0.012926 -0.012889 -0.017738 -0.01295 -0.015114 -0.071002 -0.166424 -0.007983 -0.170589 -0.005021	ANF 0 MW] 0 0.02086 0.020898 0.016049 0.020837 0.018673 -0.137215 -0.132637 0.025803 -0.136802 -0.016234 0.029024	ref' MWJ -156.7 WPS 0.000024 0.000062 -0.004788 0.0000164 -0.158052 -0.153473 0.004967 -0.157638 -0.03707	AAF 12 [MW] 0 NOSBIH 0.000799 0.000795 -0.004053 0.000735 -0.001429 -0.157317 -0.1572739 0.005702 -0.156904 -0.035032	[MW] 0 TERNA 0.160079 0.160116 0.155267 0.160055 0.157891 0.002033 0.006582 0.165022 0.002416 0.02285 0.122985	[MW] 1174.3 IPTO 0.148367 0.148404 0.143555 0.148344 0.146179 -0.009709 -0.00513 0.15331 -0.009296 0.111273	[MW] 860.9 CGES -0.000047 -0.004859 -0.004859 -0.002235 -0.158123 -0.153545 0.004896 -0.15771 -0.037142	-0.00 -0.00 -0.00 -0.00 -0.00 -0.15 -0.15 -0.15 -0.15 -0.00 -0.03

Outage 3

(Base Case)

Hub area Selected Hub

OST ESO HOPS MEPSO Transelectrica EMS ELES NOSBIH IPTO CGES

Outage 5

Outage 6

Outage

Outage 4

×

Fmax F0 RAMnet 12 RAM 12 RAMnet 21 RAM 21

-

## TNA: DACF/IDCF/D2CF Manager



#### Model builder: UCT/CGMES

#### CIM Model: SmallGrid NB 02 CIM Model: SmallGrid BB 02

CIM Network Model, scenario: SmallGrid NB 02

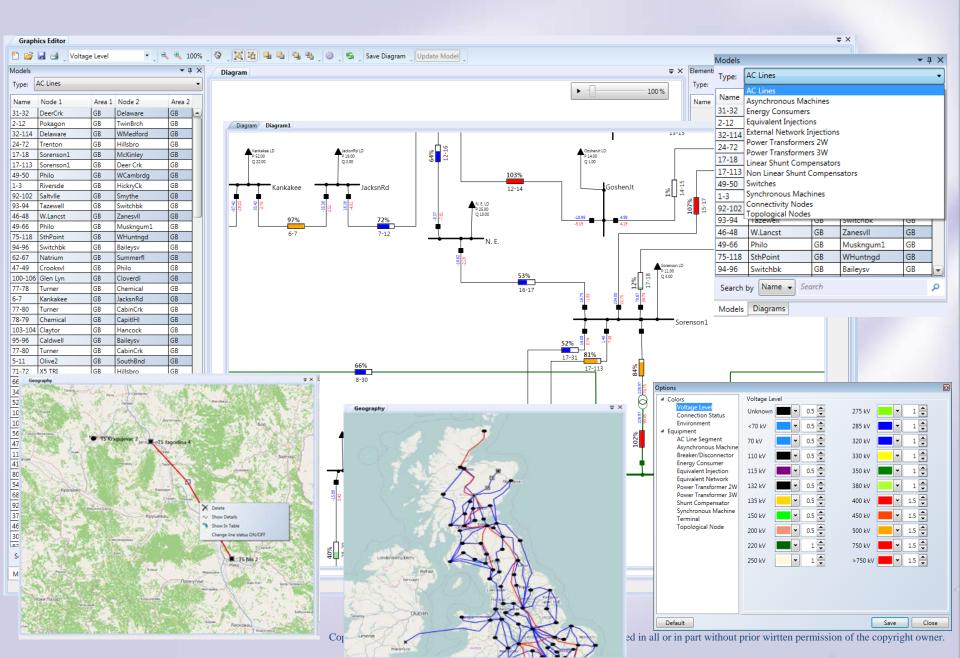
Substation         Node Name         Load Name         Energy Consumer Type         Status         Vbas         P Load         Pfixed PCt         Qfixed         Qfixe	Nodes	Energy Consu	mer												Substation	Node	1	Shunt Typ Linear Shunt Com	pensator Reus		lame	Status
Image: Difference		Culturation	Nede Nees	Lond Name	Commentary Commentary	Chattan	10	Disc	0	Dfined	D6us d Da	05										
Normal         Subjection         Stands of Contract         U         Normal	ine						_			Pfixed	Pfixed Pc	t Qitt				W.Lancst	1	Linear Shunt Com	pensator W.La	incst SC		2 <u> </u>
Name	-								_	-	-	-	· ·		Border Node	XMO_TE31	8	Equivalent Injectio	n Injec	tion		×
Unit	ner		i							-	-	-		E			1	Equivalent Injectio		tion		
Image: marring in the open in the o	for								_	-	-	-	-					0				
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Normality       Data h 0       Dergy Commen       Ø       102       10       <	F								_	-	-	-										
Image Time         Watch T	odes						_		_	-	-	-										
Note         Note that         Not							_		_	-	-	-										
Bit Monte       Entre / Construct       Entre / Construct       If 202       120       12										-	-	-	-									
New per Cr.       Der Cr. <td>B</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	B						_	-	-	-	-	-	-									
Partial         Durwin	Jer								_	-	-		I									
No         Durwin	Insi					<b>V</b>				-	-	-	-									
Image: Series         Budery	Col		Danville				_		0.0	-	-	-	-									
Image: Second trian         Reading         Reading <td>rgy</td> <td>Casterly Rock</td> <td>Bradley</td> <td>-</td> <td></td> <td></td> <td>132.0</td> <td>34.0</td> <td>8.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	rgy	Casterly Rock	Bradley	-			132.0	34.0	8.0	-	-	-	-									
Under Barender B	Ene	<u> </u>				1		18.0		-	-	-	-									
Image: space of the s	S.	Tuckborough	Wooster	Wooster LD	Energy Consumer	1	132.0	23.0	11.0	-	-	-	-									Ŧ
Nutron         v <td>hine</td> <td>Godrics Hollow</td> <td>Jay</td> <td>Jay LD</td> <td>Energy Consumer</td> <td>1</td> <td>132.0</td> <td>14.0</td> <td>8.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td>	hine	Godrics Hollow	Jay	Jay LD	Energy Consumer	1	132.0	14.0	8.0	-	-	-	-									•
Allborg         Janock         psi         V         Jaza         D0         D0           Sarch by         Energy Contumer Name:         Node Name:         Energy Contumer Law         Energy Contumer Law </td <td>Mac</td> <td>Rivendell</td> <td>Franklin</td> <td>Franklin LD</td> <td>Energy Consumer</td> <td>1</td> <td>132.0</td> <td>8.0</td> <td>3.0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Mac	Rivendell	Franklin	Franklin LD	Energy Consumer	1	132.0	8.0	3.0	-	-	-	-									
Serich y: Energy Consumer Name:       Node Name:       Energy Consumer         Contom Load       Note Conform Load       Station Stapping       Energy Consumer       Engrate	$\geq$	Aldburg	Hancock	XXX		- ✓	132.0	0.0	0.0	-	-	-	-									
	$\succ$	<		Machines Energy Consumer Border Nodes Transft	Non Conform Load Station Supply	17-18 17-113 49-50 1-3 92-102 93-94 49-66 75-118 94-96 62-67 47-49 100-106 77-78 6-7	Sorens Philo Riverso Saltvile Tazewe W.Lanc Philo SthPoin Switchi Natriur Crooks Glen Ly Turner Kankak	on1 on1 ee ell est ok n vl vl rn		McKinley Deer Crk WCambrdg HickryCk Smythe Switchbk Zanesvil Muskngum1 WHuntngd Baileysv Summerfl Philo Cloverdl Chemical JacksnRd		1         2.1           1         1.5           1         1.5           1         1.5           1         2.2           1         2.2           1         3.1           1         2.5           1         2.5           1         4.6           1         2.5           1         3.3           1         3.3           1         0.5           1         0.6           1         0.8	03         34.15           43         8.79           91         5.24           52         13.10           43         9.74           43         9.74           86         12.75           72         32.93           36         16.01           26         8.38           27         52.038           28         15.14           95         20.38           28         10.89           42         39.90           55         2.16           00         3.62	0         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0           1         0	0.000         144.0           0.000         93.3           0.000         93.4           0.000         280.0           0.000         280.0           0.000         74.4           0.000         62.0           0.000         62.0           0.000         62.0           0.000         62.0           0.000         17.5           0.000         17.6           0.000         17.9           0.000         132.0           0.000         27.8           0.000         52.6           0.000         52.6           0.000         31.5	54         5.296           20         3.233           34         2.399           74         8.673           95         2.186           77         1.623           82         2.293           22         2.186           68         3.963           91         10.681           32         3.199           56         2.577           02         4.781           16         4.585           57         3.395           31         10.752           44         0.668           66         0.816	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	1000 R 1000 R	eal eal eal eal eal eal eal eal eal eal	
Apply changes Save model				Couplers	View Cim View Slack :		Line No	ame:		First No	de Name:			Secor	nd Node Nai	ne:						

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Apply changes Save model

Close

#### TNA 2.3 Graphical builder



#### **TNA 2.3 Conversion tools**

#### Formats: UCTE - PSSE RAW - CGMES (CIM)

work Analyzer v2.1			
uilders Tools FO Builders DACF	Options \	Window H	lelp
Conversion Tools	Co	nvert CIM v1	L4.2 to UCTE
▲ Å ×	Co	nvert UCTE t	to CIM v14.2
enarios for date	Co	nvert CIM v1	L4.2 to RAW
)2cf OIdcf	Co	nvert RAW t	o CIM v14.2
15	Co	nvert UCTE t	to RAW
	Co	nvert RAW t	o UCTE
O Merged Data	Co	nvert CIM v1	16.2.4.13 to UCTE
	Co	nvert UCTE t	to CIM v16.2.4.13
	Co	nvert CIM v1	16.2.4.13 to RAW
	Co	nvert RAW t	o CIM v16.2.4.13
	Co	nvert CIM v1	16.2.4.13 to CIM v14.2
	Co	nvert CIM v1	14.2 to CIM v16.2.4.13
СТ			