

		DigSILENT PowerFactory 15.1.7	Project: Date: 4/21/2017
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Load Flow Calculation		Complete System Report: Substations, Voltage Profiles, Grid Interchange	
AC Load Flow, balanced, positive sequence	No	Automatic Model Adaptation for Convergence	No
Automatic Tap Adjust of Transformers	No	Max. Acceptable Load Flow Error for	1.00 kVA
Consider Reactive Power Limits	No	Nodes	0.10 %
		Model Equations	

Grid: DSP		System Stage: DSP				Study Case: Study Case				Annex:		/ 1		
	rated Voltage [kV]	Bus-voltage [p.u.]	[kV]	[deg]	Active Power [MW]	Reactive Power [Mvar]	Power Factor [-]	Current [kA]	Loading [%]	Additional Data				
1														
M	20.00	1.00	20.00	0.00										
Cub_1	/Xnet	External Grid			6.35	7.87	0.63	0.29		Sk":	415.69 MVA			
Cub_1	/Lne	L 0			3.60	4.35	0.64	0.16	30.92	Pv:	239.47 kW	cLod:	0.02 Mvar	L: 15.00 km
Cub_1	/Lne	Line 7			2.74	3.52	0.61	0.13	24.43	Pv:	129.50 kW	cLod:	0.02 Mvar	L: 13.00 km
10														
M7	20.00	0.92	18.41	-1.20										
Cub_1	/Lod	L8			0.53	0.71	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
Cub_1	/Lne	Line 8			-0.53	-0.71	-0.60	0.03	5.23	Pv:	4.09 kW	cLod:	0.01 Mvar	L: 9.00 km
11														
M8	20.00	0.90	17.96	-1.67										
Cub_1	/Lod	L9			0.50	0.67	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
Cub_1	/Lne	Line 10			0.50	0.42	0.77	0.02	4.65	Pv:	0.69 kW	cLod:	0.25 Mvar	L: 6.00 km
Cub_1	/Lne	Line 11			0.50	0.66	0.60	0.03	5.05	Pv:	3.39 kW	cLod:	0.01 Mvar	L: 8.00 km
Cub_1	/Lne	Line 9			-1.50	-1.75	-0.65	0.07	14.03	Pv:	36.08 kW	cLod:	0.01 Mvar	L: 11.00 km
12														
M10	20.00	0.90	17.93	-1.68										
Cub_1	/Lod	L11			0.50	0.67	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
Cub_1	/Lne	Line 10			-0.50	-0.67	-0.60	0.03	4.65	Pv:	0.69 kW	cLod:	0.25 Mvar	L: 6.00 km
13														
M12	20.00	0.89	17.78	-1.80										
Cub_1	/Lod	L10			0.49	0.66	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
Cub_1	/Lne	Line 11			-0.49	-0.66	-0.60	0.03	5.05	Pv:	3.39 kW	cLod:	0.01 Mvar	L: 8.00 km

Grid: DSP		System Stage: DSP				Study Case: Study Case					Annex:		/ 2		
		rated Voltage [kV]	Bus-voltage [p.u.]	Bus-voltage [kV]	[deg]	Active Power [MW]	Reactive Power [Mvar]	Power Factor [-]	Current [kA]	Loading [%]	Additional Data				
2	M0	20.00	0.90	18.00	-1.78										
	Cub_1	/Lod	L0			0.51	0.68	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	L 0			-3.36	-3.83	-0.66	0.16	30.92	Pv:	239.47 kW	cLod:	0.02 Mvar L: 15.00 km	
	Cub_1	/Lne	Line 1			1.86	2.35	0.62	0.10	18.20	Pv:	44.27 kW	cLod:	0.01 Mvar L: 8.00 km	
	Cub_1	/Lne	Line 4			0.50	0.17	0.95	0.02	4.65	Pv:	1.11 kW	cLod:	0.50 Mvar L: 12.00 km	
	Cub_1	/Lne	Line 6			0.49	0.64	0.61	0.03	4.99	Pv:	8.17 kW	cLod:	0.02 Mvar L: 20.00 km	
3	B	20.00	0.87	17.37	-2.32										
	Cub_1	/Lod	L3			0.47	0.63	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	Line 1			-1.82	-2.26	-0.63	0.10	18.20	Pv:	44.27 kW	cLod:	0.01 Mvar L: 8.00 km	
	Cub_1	/Lne	Line 2			1.35	1.63	0.64	0.07	13.32	Pv:	29.60 kW	cLod:	0.01 Mvar L: 10.00 km	
4	M1	20.00	0.84	16.79	-2.86										
	Cub_1	/Lod	L4			0.44	0.59	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	Line 2			-1.32	-1.57	-0.64	0.07	13.32	Pv:	29.60 kW	cLod:	0.01 Mvar L: 10.00 km	
	Cub_1	/Lne	Line 3			0.44	0.58	0.60	0.02	4.74	Pv:	2.24 kW	cLod:	0.01 Mvar L: 6.00 km	
	Cub_1	/Lne	Line 5			0.44	0.41	0.74	0.02	4.35	Pv:	0.52 kW	cLod:	0.18 Mvar L: 5.00 km	
5	M2	20.00	0.83	16.67	-2.96										
	Cub_1	/Lod	L5			0.43	0.58	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	Line 3			-0.43	-0.58	-0.60	0.03	4.74	Pv:	2.24 kW	cLod:	0.01 Mvar L: 6.00 km	
6	M3	20.00	0.90	17.95	-1.82										
	Cub_1	/Lod	L1			0.50	0.67	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	Line 4			-0.50	-0.67	-0.60	0.03	4.65	Pv:	1.11 kW	cLod:	0.50 Mvar L: 12.00 km	
7	M4	20.00	0.84	16.77	-2.87										
	Cub_1	/Lod	L6			0.44	0.59	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	Line 5			-0.44	-0.59	-0.60	0.03	4.35	Pv:	0.52 kW	cLod:	0.18 Mvar L: 5.00 km	
8	M5	20.00	0.88	17.57	-2.11										
	Cub_1	/Lod	L2			0.48	0.64	0.60	0.03		P10:	0.63 MW	Q10:	0.83 Mvar	
	Cub_1	/Lne	Line 6			-0.48	-0.64	-0.60	0.03	4.99	Pv:	8.17 kW	cLod:	0.02 Mvar L: 20.00 km	

Grid: DSP					System Stage: DSP					Study Case: Study Case					Annex: / 3				
<div>rated Voltage [kV]Bus-voltage [p.u.] [kV] [deg]Active Power [MW]Reactive Power [Mvar]Power Factor [-]Current [kA>Loading [%]</div>										Additional Data									
9																			
M620.000.9318.62-1.05																			
Cub_1 /LodL70.540.720.600.03										P10: 0.63 MWQ10: 0.83 Mvar									
Cub_1 /LneLine 7-2.62-3.25-0.630.1324.43										Pv: 129.50 kWcLod: 0.02 MvarL: 13.00 km									
Cub_1 /LneLine 80.530.700.600.035.23										Pv: 4.09 kWcLod: 0.01 MvarL: 9.00 km									
Cub_1 /LneLine 91.541.820.650.0714.03										Pv: 36.08 kWcLod: 0.01 MvarL: 11.00 km									

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Load Flow Calculation		Complete System Report: Substations, Voltage Profiles, Grid Interchange	
AC Load Flow, balanced, positive sequence	No	Automatic Model Adaptation for Convergence	No
Automatic Tap Adjust of Transformers	No	Max. Acceptable Load Flow Error for	1.00 kVA
Consider Reactive Power Limits	No	Nodes	0.10 %
		Model Equations	

Grid: DSP		System Stage: DSP			Study Case: Study Case			Annex: / 4	
		rtd.V [kV]	Bus - voltage [p.u.]	voltage [kV] [deg]	Voltage - Deviation [%] -10 -5 0 +5 +10				
1	M	20.00	1.000	20.00 0.00					
10	M7	20.00	0.921	18.41 -1.20					
11	M8	20.00	0.898	17.96 -1.67					
12	M10	20.00	0.896	17.93 -1.68					
13	M12	20.00	0.889	17.78 -1.80					
2	M0	20.00	0.900	18.00 -1.78					
3	B	20.00	0.868	17.37 -2.32					
4	M1	20.00	0.840	16.79 -2.86					
5	M2	20.00	0.834	16.67 -2.96					
6	M3	20.00	0.898	17.95 -1.82					
7	M4	20.00	0.839	16.77 -2.87					
8	M5	20.00	0.878	17.57 -2.11					
9	M6	20.00	0.931	18.62 -1.05					

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Load Flow Calculation		Complete System Report: Substations, Voltage Profiles, Grid Interchange	
AC Load Flow, balanced, positive sequence	No	Automatic Model Adaptation for Convergence	No
Automatic Tap Adjust of Transformers	No	Max. Acceptable Load Flow Error for	1.00 kVA
Consider Reactive Power Limits	No	Nodes	0.10 %
		Model Equations	

Grid: DSP		System Stage: DSP		Study Case: Study Case			Annex: / 5		
Volt. Generation Level	Motor Load	Load	Compen-sation	External Infeed	Interchange to	Power Interchange	Total Losses	Load Losses	Noload Losses
[kV]	[MW]/[Mvar]	[MW]/[Mvar]	[MW]/[Mvar]	[MW]/[Mvar]		[MW]/[Mvar]	[MW]/[Mvar]	[MW]/[Mvar]	[MW]/[Mvar]
20.00	0.00	0.00	5.85	0.00	6.35		0.50	0.50	-0.00
	0.00	0.00	7.80	0.00	7.87		0.07	1.12	-1.05
Total:	0.00	0.00	5.85	0.00	6.35	0.00	0.50	0.50	-0.00
	0.00	0.00	7.80	0.00	7.87	0.00	0.07	1.12	-1.05

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			Date: 4/21/2017

Load Flow Calculation		Complete System Report: Substations, Voltage Profiles, Grid Interchange	
AC Load Flow, balanced, positive sequence	No	Automatic Model Adaptation for Convergence	No
Automatic Tap Adjust of Transformers	No	Max. Acceptable Load Flow Error for	
Consider Reactive Power Limits	No	Nodes	1.00 kVA
		Model Equations	0.10 %

Total System Summary					Study Case: Study Case		Annex: / 6	
Generation	Motor Load	Load	Compen- sation	External Infeed	Inter Area Flow	Total Losses	Load Losses	Noload Losses
[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]	[MW]/ [Mvar]
\Wire Man\OCR Relay Cordination\Network Model\Network Data\DSP								
0.00	0.00	5.85	0.00	6.35	0.00	0.50	0.50	-0.00
0.00	0.00	7.80	0.00	7.87	0.00	0.07	1.12	-1.05
Total:								
0.00	0.00	5.85	0.00	6.35		0.50	0.50	-0.00
0.00	0.00	7.80	0.00	7.87		0.07	1.12	-1.05