

Bus and First Ring Contribution Report

Bus and First Ring Contribution Report

Study name : UNTITLED

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]			
B39_REC	0	100.00	1.016	0.900	0.00	0.00
	0.00	0.00				
			-55.2	1.100	0.00	0.00
	0.00	0.00				

-->T_REC : Voltage Regulating Transformer Connected to B39
P = -501.01 [MW] Q = -175.87 [MVAR] P losses = 0.52 [MW] Q losses = 19.31 [MVAR]
Loading = 67.3 Tap Ratio = 100.0 %

-->DC1 : DC Line Connected to B9_INV
P = 0.00 [MW] Q = 0.00 [MVAR] P losses = 0.00 [MW] Q losses = 0.00 [MVAR] Loading = 0.0

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]			
B10	0	345.00	0.897	0.900	0.00	0.00
	0.00	0.00				
			-14.6	1.100	0.00	0.00
	0.00	0.00				

-->T04 : Fixed Tap Transformer Connected to B32
P = -646.75 [MW] Q = -323.20 [MVAR] P losses = 3.25 [MW] Q losses = 129.87 [MVAR]
Loading = 80.3 Tap Ratio = 100.0 %

-->L16 : Line Connected to B11
P = 76.12 [MW] Q = 251.94 [MVAR] P losses = 0.35 [MW] Q losses = -2.01 [MVAR] Loading = 49.1

-->L17 : Line Connected to B13
P = 570.63 [MW] Q = 71.27 [MVAR] P losses = 1.64 [MW] Q losses = 11.86 [MVAR] Loading = 107.3

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]			
B20	0	230.00	0.965	0.900	0.00	628.0
0	0.00	0.00				
			-10.9	1.100	0.00	103.0
0	0.00	0.00				

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-->T12 : Fixed Tap Transformer Connected to B19
P = 378.10 [MW] Q = 8.04 [MVAR] P losses = 1.08 [MW] Q losses = 21.20 [MVAR] Loading = 34.3 Tap Ratio = 100.0 %

-->T06 : Fixed Tap Transformer Connected to B34
P = -1006.10 [MW] Q = -111.04 [MVAR] P losses = 9.90 [MW] Q losses = 198.03 [MVAR] Loading = 72.3 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]			
B30	0	16.50	1.048	0.900	250.00	0.00
	0.00	0.00				
			-27.3	1.100	338.16	0.00
	0.00	0.00				

-->T10 : Fixed Tap Transformer Connected to B2
P = 250.00 [MW] Q = 338.16 [MVAR] P losses = 0.97 [MW] Q losses = 29.17 [MVAR] Loading = 36.1 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]			
B11	0	345.00	0.885	0.900	0.00	0.00
	0.00	0.00				
			-14.8	1.100	0.00	0.00
	0.00	0.00				

-->T01 : Fixed Tap Transformer Connected to B12
P = 27.77 [MW] Q = 37.47 [MVAR] P losses = 0.04 [MW] Q losses = 1.21 [MVAR] Loading = 9.1 Tap Ratio = 100.0 %

-->L12 : Line Connected to B6
P = 48.00 [MW] Q = 216.47 [MVAR] P losses = 0.46 [MW] Q losses = -5.20 [MVAR] Loading = 43.9

-->L16 : Line Connected to B10
P = -75.77 [MW] Q = -253.94 [MVAR] P losses = 0.35 [MW] Q losses = -2.01 [MVAR] Loading = 49.1

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]			
B21	0	345.00	0.944	0.900	0.00	274.0
0	0.00	0.00				
			-27.4	1.100	0.00	115.0
0	0.00	0.00				

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-->L23 : Line Connected to B16
P = -90.48 [MW] Q = 71.73 [MVAR] P losses = 0.14 [MW] Q losses = -20.13 [MVAR] Loading = 23.2

-->L27 : Line Connected to B22
P = -183.52 [MW] Q = -186.73 [MVAR] P losses = 0.58 [MW] Q losses = -13.40 [MVAR]
Loading = 35.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR] [MW] / [MVAR]	[MW] / [MVAR]					
B31	0	16.50	0.982	0.900	898.94		9.20
	0.00	0.00					
			0.0	1.100	561.62		4.60
	0.00	0.00					

-->T03 : Fixed Tap Transformer Connected to B6
P = 889.74 [MW] Q = 557.02 [MVAR] P losses = 7.35 [MW] Q losses = 285.74 [MVAR] Loading = 115.4 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR] [MW] / [MVAR]	[MW] / [MVAR]					
B12	0	138.00	0.866	0.900	0.00		7.50
	0.00	0.00					
			-15.6	1.100	0.00		88.00
	0.00	0.00					

-->T01 : Fixed Tap Transformer Connected to B11
P = -27.73 [MW] Q = -36.26 [MVAR] P losses = 0.04 [MW] Q losses = 1.21 [MVAR] Loading = 9.1 Tap Ratio = 100.0 %

-->T02 : Fixed Tap Transformer Connected to B13
P = 20.23 [MW] Q = -51.74 [MVAR] P losses = 0.07 [MW] Q losses = 1.79 [MVAR] Loading = 11.1 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR] [MW] / [MVAR]	[MW] / [MVAR]					
B22	0	345.00	0.972	0.900	0.00		0.00
	0.00	0.00					
			-25.8	1.100	0.00		0.00
	0.00	0.00					

-->T07 : Fixed Tap Transformer Connected to B35
P = -646.99 [MW] Q = -479.97 [MVAR] P losses = 3.01 [MW] Q losses = 98.36 [MVAR]
Loading = 89.5 Tap Ratio = 100.0 %

-->L27 : Line Connected to B21

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P = 184.11 [MW] Q = 173.34 [MVAR] P losses = 0.58 [MW] Q losses = -13.40 [MVAR] L
oading = 35.7

-->L28 : Line Connected to B23
P = 462.88 [MW] Q = 306.63 [MVAR] P losses = 1.99 [MW] Q losses = 15.06 [MVAR] Lo
ading = 95.6

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD	[pu] / [deg]	[pu]	[MW] / [MVAR]		
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B32	0	16.50	0.983	0.900	650.00		0.00
	0.00	0.00					
			-6.3	1.100	453.07		0.00
	0.00	0.00					

-->T04 : Fixed Tap Transformer Connected to B10
P = 650.00 [MW] Q = 453.07 [MVAR] P losses = 3.25 [MW] Q losses = 129.87 [MVAR] L
oading = 80.3 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD	[pu] / [deg]	[pu]	[MW] / [MVAR]		
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B13	0	345.00	0.891	0.900	0.00		0.00
	0.00	0.00					
			-16.4	1.100	0.00		0.00
	0.00	0.00					

-->T02 : Fixed Tap Transformer Connected to B12
P = -20.16 [MW] Q = 53.53 [MVAR] P losses = 0.07 [MW] Q losses = 1.79 [MVAR] Load
ing = 11.1 Tap Ratio = 100.0 %

-->L17 : Line Connected to B10
P = -568.99 [MW] Q = -59.41 [MVAR] P losses = 1.64 [MW] Q losses = 11.86 [MVAR] L
oading = 107.3

-->L18 : Line Connected to B14
P = 589.15 [MW] Q = 5.87 [MVAR] P losses = 3.93 [MW] Q losses = 30.51 [MVAR] Load
ing = 110.6

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD	[pu] / [deg]	[pu]	[MW] / [MVAR]		
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B23	0	345.00	0.939	0.900	0.00		247.5
0	800.00	0.00					
			-28.5	1.100	0.00		84.60
	600.00	0.00					

-->T08 : Fixed Tap Transformer Connected to B36
P = -557.42 [MW] Q = -379.51 [MVAR] P losses = 2.58 [MW] Q losses = 140.39 [MVAR]

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Loading = 84.3 Tap Ratio = 100.0 %

-->L28 : Line Connected to B22

P = -460.89 [MW] Q = -291.57 [MVAR] P losses = 1.99 [MW] Q losses = 15.06 [MVAR]
Loading = 95.6

-->L29 : Line Connected to B24

P = -29.19 [MW] Q = -13.51 [MVAR] P losses = 0.02 [MW] Q losses = -31.45 [MVAR] L
oading = 5.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B33	0	16.50	0.997	0.900	632.00	0.00	
	0.00	0.00	-8.8	1.100	241.26	0.00	
	0.00	0.00					

-->T05 : Fixed Tap Transformer Connected to B19

P = 632.00 [MW] Q = 241.26 [MVAR] P losses = 3.22 [MW] Q losses = 65.33 [MVAR] Lo
ading = 72.5 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B14	0	345.00	0.887	0.900	0.00	0.00	
	0.00	0.00	-20.7	1.100	0.00	0.00	
	0.00	0.00					

-->L18 : Line Connected to B13

P = -585.22 [MW] Q = 24.63 [MVAR] P losses = 3.93 [MW] Q losses = 30.51 [MVAR] Lo
ading = 110.6

-->L08 : Line Connected to B4

P = 235.59 [MW] Q = 81.23 [MVAR] P losses = 0.64 [MW] Q losses = -0.35 [MVAR] Loa
ding = 47.7

-->L19 : Line Connected to B15

P = 349.63 [MW] Q = -105.86 [MVAR] P losses = 2.99 [MW] Q losses = 6.65 [MVAR] Lo
ading = 69.0

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B24	0	345.00	0.938	0.900	0.00	308.6	
0	0.00	0.00	-27.9	1.100	0.00	-92.2	
0	0.00	0.00					

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-->L24 : Line Connected to B16
P = -337.81 [MW] Q = 110.14 [MVAR] P losses = 0.43 [MW] Q losses = 2.55 [MVAR] Loading = 63.7

-->L29 : Line Connected to B23
P = 29.21 [MW] Q = -17.94 [MVAR] P losses = 0.02 [MW] Q losses = -31.45 [MVAR] Loading = 5.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B34	0	16.50	1.012	0.900	1016.00	0.00	
	0.00	0.00					
			-0.2	1.100	309.07	0.00	
	0.00	0.00					

-->T06 : Fixed Tap Transformer Connected to B20
P = 1016.00 [MW] Q = 309.07 [MVAR] P losses = 9.90 [MW] Q losses = 198.03 [MVAR]
Loading = 72.3 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B15	0	345.00	0.906	0.900	0.00	320.0	
0	0.00	0.00					
			-26.2	1.100	0.00	153.0	
0	0.00	0.00					

-->L20 : Line Connected to B16
P = 26.64 [MW] Q = -265.51 [MVAR] P losses = 0.74 [MW] Q losses = -6.72 [MVAR] Loading = 41.1

-->L19 : Line Connected to B14
P = -346.64 [MW] Q = 112.51 [MVAR] P losses = 2.99 [MW] Q losses = 6.65 [MVAR] Loading = 69.0

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B25	0	345.00	1.008	0.900	0.00	224.0	
0	0.00	0.00					
			-28.0	1.100	0.00	47.20	
	0.00	0.00					

-->T09 : Fixed Tap Transformer Connected to B37
P = -538.28 [MW] Q = -39.70 [MVAR] P losses = 1.72 [MW] Q losses = 66.54 [MVAR] Loading = 67.5 Tap Ratio = 100.0 %

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-->L30 : Line Connected to B26
P = -7.55 [MW] Q = 28.22 [MVAR] P losses = 0.09 [MW] Q losses = -50.29 [MVAR] Loading = 4.8

-->L04 : Line Connected to B2
P = 321.83 [MW] Q = -35.72 [MVAR] P losses = 7.19 [MW] Q losses = -5.72 [MVAR] Loading = 53.5

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B35	0	16.50	1.049	0.900	650.00		0.00
	0.00	0.00					
			-20.8	1.100	578.33		0.00
	0.00	0.00					

-->T07 : Fixed Tap Transformer Connected to B22
P = 650.00 [MW] Q = 578.33 [MVAR] P losses = 3.01 [MW] Q losses = 98.36 [MVAR] Loading = 89.5 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B16	0	345.00	0.933	0.900	0.00		329.0
0	0.00	0.00					
			-26.5	1.100	0.00		32.30
	0.00	0.00					

-->L20 : Line Connected to B15
P = -25.90 [MW] Q = 258.79 [MVAR] P losses = 0.74 [MW] Q losses = -6.72 [MVAR] Loading = 41.1

-->L21 : Line Connected to B17
P = 256.67 [MW] Q = -121.12 [MVAR] P losses = 0.63 [MW] Q losses = -3.69 [MVAR] Loading = 50.9

-->L22 : Line Connected to B19
P = -988.62 [MW] Q = 29.48 [MVAR] P losses = 17.18 [MW] Q losses = 192.25 [MVAR] Loading = 98.6

-->L23 : Line Connected to B21
P = 90.61 [MW] Q = -91.87 [MVAR] P losses = 0.14 [MW] Q losses = -20.13 [MVAR] Loading = 23.2

-->L24 : Line Connected to B24
P = 338.24 [MW] Q = -107.59 [MVAR] P losses = 0.43 [MW] Q losses = 2.55 [MVAR] Loading = 63.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				

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Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD	[KV] [pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] / [MVAR]
B26	0	345.00	0.991	0.900	0.00	139.0
0	0.00	0.00	-27.8	1.100	0.00	17.00
	0.00	0.00				

-->L30 : Line Connected to B25
P = 7.65 [MW] Q = -78.51 [MVAR] P losses = 0.09 [MW] Q losses = -50.29 [MVAR] Loading = 4.8

-->L31 : Line Connected to B27
P = 183.89 [MW] Q = 167.23 [MVAR] P losses = 0.94 [MW] Q losses = -12.99 [MVAR] Loading = 42.0

-->L32 : Line Connected to B28
P = -140.98 [MW] Q = -51.25 [MVAR] P losses = 0.88 [MW] Q losses = -68.05 [MVAR] Loading = 25.3

-->L33 : Line Connected to B29
P = -189.56 [MW] Q = -54.47 [MVAR] P losses = 2.09 [MW] Q losses = -80.25 [MVAR] Loading = 33.3

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD	[KV] [pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] / [MVAR]
B36	0	16.50	1.064	0.900	560.00	0.00
	0.00	0.00	-19.9	1.100	519.91	0.00
	0.00	0.00				

-->T08 : Fixed Tap Transformer Connected to B23
P = 560.00 [MW] Q = 519.91 [MVAR] P losses = 2.58 [MW] Q losses = 140.39 [MVAR] Loading = 84.3 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD	[KV] [pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] / [MVAR]
B17	0	345.00	0.942	0.900	0.00	0.00
	0.00	0.00	-28.1	1.100	0.00	0.00
	0.00	0.00				

-->L21 : Line Connected to B16
P = -256.04 [MW] Q = 117.43 [MVAR] P losses = 0.63 [MW] Q losses = -3.69 [MVAR] Loading = 50.9

-->L25 : Line Connected to B18
P = 157.66 [MW] Q = 11.97 [MVAR] P losses = 0.20 [MW] Q losses = -9.35 [MVAR] Loading = 28.1

-->L26 : Line Connected to B27
P = 98.38 [MW] Q = -129.40 [MVAR] P losses = 0.33 [MW] Q losses = -24.68 [MVAR] Loading = 28.9

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Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B27	0	345.00	0.962	0.900	0.00	281.0	
0	0.00	0.00					
			-29.2	1.100	0.00	75.50	
	0.00	0.00					

-->L31 : Line Connected to B26

P = -182.95 [MW] Q = -180.22 [MVAR] P losses = 0.94 [MW] Q losses = -12.99 [MVAR]

Loading = 42.0

-->L26 : Line Connected to B17

P = -98.05 [MW] Q = 104.72 [MVAR] P losses = 0.33 [MW] Q losses = -24.68 [MVAR] Loading = 28.9

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B37	0	16.50	1.028	0.900	540.00	0.00	
	0.00	0.00					
			-21.1	1.100	106.24	0.00	
	0.00	0.00					

-->T09 : Fixed Tap Transformer Connected to B25

P = 540.00 [MW] Q = 106.24 [MVAR] P losses = 1.72 [MW] Q losses = 66.54 [MVAR] Loading = 67.5 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B18	0	345.00	0.939	0.900	0.00	158.0	
0	0.00	0.00					
			-28.9	1.100	0.00	30.00	
	0.00	0.00					

-->L25 : Line Connected to B17

P = -157.46 [MW] Q = -21.32 [MVAR] P losses = 0.20 [MW] Q losses = -9.35 [MVAR] Loading = 28.1

-->L06 : Line Connected to B3

P = -0.54 [MW] Q = -8.68 [MVAR] P losses = 0.00 [MW] Q losses = -18.90 [MVAR] Loading = 1.8

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					

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[MVAR]	[MW] / [MVAR]	[KV] [MW] / [MVAR]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
=====	=====	=====	=====	=====	=====	=====
B28	0	345.00	1.005	0.900	0.00	206.0
0	0.00	0.00	-24.0	1.100	0.00	27.60
	0.00	0.00				

-->L32 : Line Connected to B26
P = 141.86 [MW] Q = -16.79 [MVAR] P losses = 0.88 [MW] Q losses = -68.05 [MVAR] L
oading = 25.3

-->L34 : Line Connected to B29
P = -347.86 [MW] Q = -10.81 [MVAR] P losses = 1.68 [MW] Q losses = -7.24 [MVAR] L
oading = 57.9

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
[MVAR]	[MW] / [MVAR]	[KV] [MW] / [MVAR]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
=====	=====	=====	=====	=====	=====	=====	=====
B38	0	16.50	1.026	0.900	830.00	0.00	
	0.00	0.00	-13.9	1.100	108.42	0.00	
	0.00	0.00					

-->T11 : Fixed Tap Transformer Connected to B29
P = 830.00 [MW] Q = 108.42 [MVAR] P losses = 5.32 [MW] Q losses = 103.73 [MVAR] L
oading = 75.0 Tap Ratio = 100.0 %

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
[MVAR]	[MW] / [MVAR]	[KV] [MW] / [MVAR]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
=====	=====	=====	=====	=====	=====	=====	=====
B19	0	345.00	0.962	0.900	0.00	0.00	
	0.00	0.00	-14.1	1.100	0.00	0.00	
	0.00	0.00					

-->T12 : Fixed Tap Transformer Connected to B20
P = -377.02 [MW] Q = 13.16 [MVAR] P losses = 1.08 [MW] Q losses = 21.20 [MVAR] Lo
ading = 34.3 Tap Ratio = 100.0 %

-->T05 : Fixed Tap Transformer Connected to B33
P = -628.78 [MW] Q = -175.94 [MVAR] P losses = 3.22 [MW] Q losses = 65.33 [MVAR]
Loading = 72.5 Tap Ratio = 100.0 %

-->L22 : Line Connected to B16
P = 1005.80 [MW] Q = 162.77 [MVAR] P losses = 17.18 [MW] Q losses = 192.25 [MVAR]
Loading = 98.6

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
[MVAR]	[MW] / [MVAR]	[KV] [MW] / [MVAR]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
=====	=====	=====	=====	=====	=====	=====	=====

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[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B29	0	345.00	1.011	0.900	0.00	283.5
0	0.00	0.00				
			-21.0	1.100	0.00	26.90
	0.00	0.00				

-->T11 : Fixed Tap Transformer Connected to B38
P = -824.68 [MW] Q = -4.69 [MVAR] P losses = 5.32 [MW] Q losses = 103.73 [MVAR] L
oading = 75.0 Tap Ratio = 100.0 %

-->L33 : Line Connected to B26
P = 191.64 [MW] Q = -25.78 [MVAR] P losses = 2.09 [MW] Q losses = -80.25 [MVAR] L
oading = 33.3

-->L34 : Line Connected to B28
P = 349.54 [MW] Q = 3.56 [MVAR] P losses = 1.68 [MW] Q losses = -7.24 [MVAR] Load
ing = 57.9

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
[MVAR]	[MW] / [MVAR]	[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
B39	0	345.00	1.030	0.900	1000.00	1104.
00	0.00	0.00				
			-53.3	1.100	592.95	250.0
0	0.00	0.00				

-->T_REC : Voltage Regulating Transformer Connected to B39_REC
P = 501.52 [MW] Q = 195.18 [MVAR] P losses = 0.52 [MW] Q losses = 19.31 [MVAR] Lo
ading = 67.3 Tap Ratio = 100.0 %

-->L02 : Line Connected to B1
P = -605.52 [MW] Q = 147.77 [MVAR] P losses = 3.79 [MW] Q losses = 17.28 [MVAR] L
oading = 104.1

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
[MVAR]	[MW] / [MVAR]	[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
B9_INV	0	100.00	0.707	0.900	0.00	0.00
	0.00	0.00				
			5.8	1.100	0.00	0.00
	0.00	0.00				

-->T_INV : Voltage Regulating Transformer Connected to B9
P = 500.00 [MW] Q = -117.41 [MVAR] P losses = 1.00 [MW] Q losses = 37.32 [MVAR] L
oading = 65.3 Tap Ratio = 100.0 %

-->DC1 : DC Line Connected to B39_REC
P = 0.00 [MW] Q = 0.00 [MVAR] P losses = 0.00 [MW] Q losses = 0.00 [MVAR] Loading
= 0.0

Bus and First Ring Contribution Report

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B1	0	345.00	1.001	0.900	0.00	0.00	
	0.00	0.00	-44.7	1.100	0.00	0.00	
	0.00	0.00					

-->L01 : Line Connected to B2
P = -609.31 [MW] Q = 130.50 [MVAR] P losses = 13.91 [MW] Q losses = 94.23 [MVAR]
Loading = 104.1

-->L02 : Line Connected to B39
P = 609.31 [MW] Q = -130.50 [MVAR] P losses = 3.79 [MW] Q losses = 17.28 [MVAR] L
oading = 104.1

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B2	0	345.00	0.989	0.900	0.00	0.00	
	0.00	0.00	-29.7	1.100	0.00	0.00	
	0.00	0.00					

-->T10 : Fixed Tap Transformer Connected to B30
P = -249.03 [MW] Q = -308.99 [MVAR] P losses = 0.97 [MW] Q losses = 29.17 [MVAR]
Loading = 36.1 Tap Ratio = 100.0 %

-->L01 : Line Connected to B1
P = 623.22 [MW] Q = -36.27 [MVAR] P losses = 13.91 [MW] Q losses = 94.23 [MVAR] L
oading = 104.1

-->L03 : Line Connected to B3
P = -59.54 [MW] Q = 315.26 [MVAR] P losses = 1.48 [MW] Q losses = -6.76 [MVAR] Lo
ading = 54.3

-->L04 : Line Connected to B25
P = -314.64 [MW] Q = 30.00 [MVAR] P losses = 7.19 [MW] Q losses = -5.72 [MVAR] Lo
ading = 53.5

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /	
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B3	0	345.00	0.939	0.900	0.00	322.0	
0	0.00	0.00	-28.9	1.100	0.00	2.40	
	0.00	0.00					

-->L03 : Line Connected to B2
P = 61.02 [MW] Q = -322.01 [MVAR] P losses = 1.48 [MW] Q losses = -6.76 [MVAR] Lo
ading = 54.3

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-->L05 : Line Connected to B4
P = -383.56 [MW] Q = 329.84 [MVAR] P losses = 3.85 [MW] Q losses = 45.15 [MVAR] L
oading = 90.1

-->L06 : Line Connected to B18
P = 0.54 [MW] Q = -10.22 [MVAR] P losses = 0.00 [MW] Q losses = -18.90 [MVAR] Loa
ding = 1.8

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B4	0	345.00	0.872	0.900	0.00		500.0
0	0.00	0.00					
			-22.9	1.100	0.00		184.0
0	0.00	0.00					

-->L05 : Line Connected to B3
P = 387.42 [MW] Q = -284.68 [MVAR] P losses = 3.85 [MW] Q losses = 45.15 [MVAR] L
oading = 90.1

-->L07 : Line Connected to B5
P = -652.47 [MW] Q = 182.26 [MVAR] P losses = 4.84 [MW] Q losses = 67.48 [MVAR] L
oading = 129.9

-->L08 : Line Connected to B14
P = -234.95 [MW] Q = -81.58 [MVAR] P losses = 0.64 [MW] Q losses = -0.35 [MVAR] L
oading = 47.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /
	[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B5	0	345.00	0.856	0.900	0.00		0.00
	0.00	0.00					
			-16.3	1.100	0.00		0.00
	0.00	0.00					

-->L10 : Line Connected to B8
P = 36.24 [MW] Q = 288.85 [MVAR] P losses = 0.96 [MW] Q losses = 3.07 [MVAR] Load
ing = 56.9

-->L07 : Line Connected to B4
P = 657.31 [MW] Q = -114.78 [MVAR] P losses = 4.84 [MW] Q losses = 67.48 [MVAR] L
oading = 129.9

-->L09 : Line Connected to B6
P = -693.55 [MW] Q = -174.07 [MVAR] P losses = 1.39 [MW] Q losses = 14.89 [MVAR]
Loading = 139.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD					
		[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]		[MW] /

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[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]				
B6	0	345.00	0.864	0.900	0.00	0.00
	0.00	0.00	-15.0	1.100	0.00	0.00
	0.00	0.00				

-->T03 : Fixed Tap Transformer Connected to B31

P = -882.39 [MW] Q = -271.29 [MVAR] P losses = 7.35 [MW] Q losses = 285.74 [MVAR]

Loading = 115.4 Tap Ratio = 100.0 %

-->L11 : Line Connected to B7

P = 234.99 [MW] Q = 304.00 [MVAR] P losses = 1.21 [MW] Q losses = 10.43 [MVAR] Loading = 74.5

-->L12 : Line Connected to B11

P = -47.53 [MW] Q = -221.67 [MVAR] P losses = 0.46 [MW] Q losses = -5.20 [MVAR] Loading = 43.9

-->L09 : Line Connected to B5

P = 694.94 [MW] Q = 188.96 [MVAR] P losses = 1.39 [MW] Q losses = 14.89 [MVAR] Loading = 139.7

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD	[pu] / [deg]	[pu]	[MW] / [MVAR]		
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B7	0	345.00	0.829	0.900	0.00		233.8
0	0.00	0.00	-16.5	1.100	0.00		84.00
	0.00	0.00					

-->L11 : Line Connected to B6

P = -233.78 [MW] Q = -293.57 [MVAR] P losses = 1.21 [MW] Q losses = 10.43 [MVAR] Loading = 74.5

-->L13 : Line Connected to B8

P = -0.02 [MW] Q = 209.57 [MVAR] P losses = 0.26 [MW] Q losses = -2.28 [MVAR] Loading = 42.3

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S	LO
AD	MOTOR LOAD	SHUNT LOAD	[pu] / [deg]	[pu]	[MW] / [MVAR]		
[MVAR]	[MW] / [MVAR]	[MW] / [MVAR]					
B8	0	345.00	0.818	0.900	0.00		522.0
0	0.00	0.00	-16.5	1.100	0.00		176.0
	0.00	0.00					

-->L10 : Line Connected to B5

P = -35.28 [MW] Q = -285.78 [MVAR] P losses = 0.96 [MW] Q losses = 3.07 [MVAR] Loading = 56.9

-->L13 : Line Connected to B7

P = 0.28 [MW] Q = -211.85 [MVAR] P losses = 0.26 [MW] Q losses = -2.28 [MVAR] Loading =

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ding = 42.3

-->L14 : Line Connected to B9

P = -487.00 [MW] Q = 321.63 [MVAR] P losses = 12.00 [MW] Q losses = 166.90 [MVAR]

Loading = 119.4

Bus ID	Zone	BASE VOLT	VOLTAGE/ANG	MIN/MAX LIM	GENERATION	S LO
AD	MOTOR LOAD	SHUNT LOAD				
[MVAR]	[MW] / [MVAR]	[KV]	[pu] / [deg]	[pu]	[MW] / [MVAR]	[MW] /
		[MW] / [MVAR]				
B9	0	345.00	0.719	0.900	0.00	0.00
	0.00	0.00				
			1.8	1.100	0.00	0.00
	0.00	0.00				

-->T_INV : Voltage Regulating Transformer Connected to B9_INV

P = -499.01 [MW] Q = 154.73 [MVAR] P losses = 1.00 [MW] Q losses = 37.32 [MVAR] L
oading = 65.3 Tap Ratio = 100.0 %

-->L14 : Line Connected to B8

P = 499.01 [MW] Q = -154.73 [MVAR] P losses = 12.00 [MW] Q losses = 166.90 [MVAR]

Loading = 119.4