

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 1
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Bus Loading Summary Report

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic		MVA	% PF	Amp	Percent Loading
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar				
Bus1	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	207.4	
Bus2	20.000		0	0	0	0	0	0	0	0	0.131	83.2	4.1	
Bus5	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	324.1	
Bus6	20.000		0	0	0	0	0	0	0	0	0.335	83.2	10.6	
Bus7	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	207.4	
Bus8	20.000		0	0	0	0	0	0	0	0	0.466	83.3	14.8	
Bus11	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	64.8	
Bus12	20.000		0	0	0	0	0	0	0	0	0.507	83.3	16.1	
Bus13	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	304.4	
Bus14	20.000		0	0	0	0	0	0	0	0	12.368	83.2	369.1	
Bus15	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	121.9	
Bus16	20.000		0	0	0	0	0	0	0	0	12.153	83.2	363.0	
Bus21	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	305.4	
Bus22	20.000		0	0	0	0	0	0	0	0	9.529	83.1	285.3	
Bus23	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	244.6	
Bus24	20.000		0	0	0	0	0	0	0	0	9.314	83.1	279.2	
Bus25	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	195.3	
Bus26	20.000		0	0	0	0	0	0	0	0	2.516	83.9	75.3	
Bus27	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	122.1	
Bus28	20.000		0	0	0	0	0	0	0	0	2.384	84.0	71.4	
Bus31	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	244.4	
Bus32	20.000		0	0	0	0	0	0	0	0	2.302	84.0	68.9	
Bus33	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	123.9	
Bus34	20.000		0	0	0	0	0	0	0	0	1.506	84.1	45.7	
Bus37	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	129.5	
Bus38	20.000		0	0	0	0	0	0	0	0	1.389	83.3	44.0	
Bus41	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	408.2	
Bus42	20.000		0	0	0	0	0	0	0	0	1.307	83.3	41.4	
Bus43	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	408.2	
Bus44	20.000		0	0	0	0	0	0	0	0	0.543	83.3	17.2	
Bus45	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	129.6	
Bus46	20.000		0	0	0	0	0	0	0	0	0.082	83.2	2.6	
Bus47	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	324.0	
Bus48	20.000		0	0	0	0	0	0	0	0	0.205	83.2	6.5	
Bus49	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	309.6	
Bus50	20.000		0	0	0	0	0	0	0	0	0.611	83.6	18.5	

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 2
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic		MVA	% PF	Amp	Percent Loading
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar				
Bus51	0.400		0.272	0.169	0	0	0	0	0	0	0.320	85.0	495.5	
Bus52	20.000		0	0	0	0	0	0	0	0	0.407	83.7	12.3	
Bus53	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	122.0	
Bus54	20.000		0	0	0	0	0	0	0	0	0.080	84.6	2.4	
Bus59	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	388.0	
Bus60	20.000		0	0	0	0	0	0	0	0	8.818	83.2	266.6	
Bus62	20.000		0	0	0	0	0	0	0	0	9.091	83.2	274.4	
Bus63	20.000		0	0	0	0	0	0	0	0	0.530	83.4	16.0	
Bus64	0.400		0.272	0.169	0	0	0	0	0	0	0.320	85.0	493.7	
Bus67	20.000		0	0	0	0	0	0	0	0	0.204	83.4	6.2	
Bus68	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	308.6	
Bus80	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	309.1	
Bus81	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	123.7	
Bus82	20.000		0	0	0	0	0	0	0	0	7.953	83.2	241.9	
Bus83	20.000		0	0	0	0	0	0	0	0	8.062	83.2	244.4	
Bus84	20.000		0	0	0	0	0	0	0	0	8.273	83.2	250.6	
Bus85	0.400		0.017	0.011	0	0	0	0	0	0	0.020	85.0	31.1	
Bus86	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	199.1	
Bus87	20.000		0	0	0	0	0	0	0	0	7.699	83.3	234.9	
Bus88	20.000		0	0	0	0	0	0	0	0	7.837	83.2	238.8	
Bus89	20.000		0	0	0	0	0	0	0	0	7.864	83.2	239.5	
Bus90	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	392.3	
Bus91	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	124.2	
Bus92	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	124.6	
Bus93	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	249.9	
Bus94	20.000		0	0	0	0	0	0	0	0	7.171	83.3	219.5	
Bus95	20.000		0	0	0	0	0	0	0	0	7.339	83.3	224.5	
Bus96	20.000		0	0	0	0	0	0	0	0	7.440	83.3	227.0	
Bus97	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	312.5	
Bus98	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	125.1	
Bus99	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	125.1	
Bus100	20.000		0	0	0	0	0	0	0	0	6.333	83.3	194.2	
Bus101	20.000		0	0	0	0	0	0	0	0	6.418	83.3	196.7	
Bus102	20.000		0	0	0	0	0	0	0	0	6.962	83.3	213.3	
Bus103	0.400		0.017	0.011	0	0	0	0	0	0	0.020	85.0	31.3	
Bus108	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	394.1	
Bus109	20.000		0	0	0	0	0	0	0	0	0.461	83.3	14.1	
Bus110	20.000		0	0	0	0	0	0	0	0	0.204	83.3	6.3	

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 3
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic		MVA	% PF	Amp	Percent Loading
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar				
Bus111	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	312.8	
Bus116	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	125.3	
Bus117	20.000		0	0	0	0	0	0	0	0	0.584	83.4	17.9	
Bus118	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.5	
Bus119	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	125.3	
Bus121	20.000		0	0	0	0	0	0	0	0	0.714	83.4	21.9	
Bus122	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	200.4	
Bus123	20.000		0	0	0	0	0	0	0	0	0.420	83.4	12.9	
Bus124	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	250.5	
Bus125	20.000		0	0	0	0	0	0	0	0	0.257	83.3	7.9	
Bus126	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	394.6	
Bus145	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	251.9	
Bus146	0.400		0.017	0.011	0	0	0	0	0	0	0.020	85.0	31.5	
Bus147	20.000		0	0	0	0	0	0	0	0	5.569	83.4	171.7	
Bus148	20.000		0	0	0	0	0	0	0	0	5.548	83.4	171.0	
Bus149	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	398.1	
Bus150	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	63.2	
Bus151	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	316.8	
Bus152	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	317.0	
Bus153	20.000		0	0	0	0	0	0	0	0	4.686	83.5	145.4	
Bus154	20.000		0	0	0	0	0	0	0	0	4.894	83.4	151.7	
Bus155	20.000		0	0	0	0	0	0	0	0	4.942	83.4	153.0	
Bus156	20.000		0	0	0	0	0	0	0	0	5.203	83.4	161.0	
Bus157	20.000		0	0	0	0	0	0	0	0	5.373	83.4	166.0	
Bus158	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	252.5	
Bus163	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	126.8	
Bus164	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.5	
Bus165	20.000		0	0	0	0	0	0	0	0	0.408	83.4	12.7	
Bus166	0.400		0.272	0.169	0	0	0	0	0	0	0.320	85.0	507.3	
Bus177	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.1	
Bus178	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	400.5	
Bus179	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	203.7	
Bus180	0.400		0.136	0.084	0	0	0	0	0	0	0.160	85.0	254.9	
Bus181	20.000		0	0	0	0	0	0	0	0	3.465	83.5	108.0	
Bus182	20.000		0	0	0	0	0	0	0	0	3.599	83.5	112.1	
Bus183	20.000		0	0	0	0	0	0	0	0	3.941	83.5	122.6	
Bus184	20.000		0	0	0	0	0	0	0	0	4.025	83.5	125.1	
Bus185	20.000		0	0	0	0	0	0	0	0	4.072	83.5	126.4	

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 4
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic		MVA	% PF	Amp	Percent Loading
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar				
Bus186	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	63.4	
Bus189	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.2	
Bus190	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.5	
Bus194	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.5	
Bus195	20.000		0	0	0	0	0	0	0	0	3.300	83.6	102.9	
Bus196	20.000		0	0	0	0	0	0	0	0	1.381	83.3	43.1	
Bus197	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.6	
Bus214	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	402.0	
Bus215	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.6	
Bus216	20.000		0	0	0	0	0	0	0	0	1.299	83.3	40.6	
Bus217	20.000		0	0	0	0	0	0	0	0	1.217	83.3	38.0	
Bus224	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus225	20.000		0	0	0	0	0	0	0	0	0.960	83.3	30.0	
Bus226	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.6	
Bus227	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus230	20.000		0	0	0	0	0	0	0	0	0.797	83.3	24.9	
Bus231	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus232	20.000		0	0	0	0	0	0	0	0	0.163	83.3	5.1	
Bus233	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus234	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.6	
Bus235	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus236	20.000		0	0	0	0	0	0	0	0	0.552	83.3	17.2	
Bus237	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus244	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	204.3	
Bus245	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	127.7	
Bus246	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.6	
Bus247	20.000		0	0	0	0	0	0	0	0	0.213	83.3	6.6	
Bus248	20.000		0	0	0	0	0	0	0	0	0.470	83.3	14.7	
Bus249	0.400		0.214	0.133	0	0	0	0	0	0	0.252	85.0	402.2	
Bus264	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	130.4	
Bus265	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	325.9	
Bus266	20.000		0	0	0	0	0	0	0	0	1.807	83.6	57.6	
Bus267	20.000		0	0	0	0	0	0	0	0	1.602	83.7	51.1	
Bus268	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	130.4	
Bus269	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	131.0	
Bus270	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	329.0	
Bus271	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	131.6	
Bus272	20.000		0	0	0	0	0	0	0	0	0.661	83.6	21.2	

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 5
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic		MVA	% PF	Amp	Percent Loading
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar				
Bus273	20.000		0	0	0	0	0	0	0	0	0.865	83.5	27.8	
Bus274	20.000		0	0	0	0	0	0	0	0	0.947	83.7	30.3	
Bus275	20.000		0	0	0	0	0	0	0	0	1.439	83.7	45.9	
Bus276	20.000		0	0	0	0	0	0	0	0	1.520	83.7	48.5	
Bus277	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	130.4	
Bus282	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	130.4	
Bus283	20.000		0	0	0	0	0	0	0	0	0.082	83.2	2.6	
Bus284	20.000		0	0	0	0	0	0	0	0	0.409	83.2	13.0	
Bus285	0.400		0.170	0.105	0	0	0	0	0	0	0.200	85.0	326.1	
Bus291	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	65.2	
Bus292	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	65.2	
Bus293	20.000		0	0	0	0	0	0	0	0	0.123	83.3	3.9	
Bus294	20.000		0	0	0	0	0	0	0	0	0.082	83.3	2.6	
Bus295	20.000		0	0	0	0	0	0	0	0	0.041	83.2	1.3	
Bus296	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	65.2	
Bus299	0.400		0.109	0.067	0	0	0	0	0	0	0.128	85.0	211.0	
Bus300	20.000		0	0	0	0	0	0	0	0	0.580	83.4	18.7	
Bus317	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	66.0	
Bus318	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	131.9	
Bus319	20.000		0	0	0	0	0	0	0	0	0.450	83.3	14.5	
Bus320	20.000		0	0	0	0	0	0	0	0	0.368	83.3	11.9	
Bus321	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	132.0	
Bus322	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	66.0	
Bus323	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	66.0	
Bus324	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	66.0	
Bus325	20.000		0	0	0	0	0	0	0	0	0.122	83.4	3.9	
Bus326	20.000		0	0	0	0	0	0	0	0	0.163	83.3	5.3	
Bus327	20.000		0	0	0	0	0	0	0	0	0.204	83.3	6.6	
Bus328	20.000		0	0	0	0	0	0	0	0	0.286	83.3	9.2	
Bus329	20.000		0	0	0	0	0	0	0	0	0.327	83.3	10.5	
Bus330	0.400		0.034	0.021	0	0	0	0	0	0	0.040	85.0	66.0	
Bus331	0.400		0.068	0.042	0	0	0	0	0	0	0.080	85.0	132.0	
Bus332	20.000		0	0	0	0	0	0	0	0	0.082	83.1	2.6	
Bus335	20.000		0	0	0	0	0	0	0	0	12.383	83.2	369.1	
Bus336	150.000		0	0	0	0	0	0	0	0	12.786	80.7	49.2	
Bus337	20.000		0	0	0	0	0	0	0	0	2.117	84.0	64.2	
Bus338	20.000		0	0	0	0	0	0	0	0	12.056	83.2	360.6	
Bus339	20.000		0	0	0	0	0	0	0	0	6.880	83.3	210.8	

Project:

Location:

Contract:

Engineer:

Filename: widia

ETAP

12.6.0H

Study Case: LF

Page: 6

Date: 08-21-2018

SN:

Revision: Base

Config.: Normal

* Indicates operating load of a bus exceeds the bus critical limit (100.0% of the Continuous Ampere rating).

Indicates operating load of a bus exceeds the bus marginal limit (95.0% of the Continuous Ampere rating).

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 7
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Branch Loading Summary Report

CKT / Branch		Cable & Reactor			Transformer				
					Capability (MVA)	Loading (input)		Loading (output)	
						MVA	%	MVA	%
ID	Type	Ampacity (Amp)	Loading Amp	%					
T1	Transformer				0.160	0.131	81.8	0.128	80.0
T3	Transformer				0.250	0.205	81.8	0.200	80.0
T4	Transformer				0.160	0.131	81.8	0.128	80.0
T6	Transformer				0.050	0.041	81.8	0.040	80.0
T7	Transformer				30.000	12.786	42.6	12.383	41.3
T8	Transformer				0.100	0.082	81.6	0.080	80.0
T10	Transformer				0.250	0.204	81.6	0.200	80.0
T11	Transformer				0.200	0.163	81.6	0.160	80.0
T12	Transformer				0.160	0.131	81.6	0.128	80.0
T13	Transformer				0.100	0.082	81.6	0.080	80.0
T15	Transformer				0.200	0.163	81.6	0.160	80.0
T16	Transformer				0.100	0.082	81.6	0.080	80.0
T18	Transformer				0.100	0.082	81.8	0.080	80.0
T20	Transformer				0.315	0.258	81.8	0.252	80.0
T21	Transformer				0.315	0.258	81.8	0.252	80.0
T22	Transformer				0.100	0.082	81.8	0.080	80.0
T23	Transformer				0.250	0.205	81.8	0.200	80.0
T24	Transformer				0.250	0.204	81.6	0.200	80.0
T25	Transformer				0.400	0.327	81.6	0.320	80.0
T26	Transformer				0.400	0.080	20.1	0.080	20.0
T29	Transformer				0.315	0.257	81.6	0.252	80.0
T31	Transformer				0.400	0.327	81.6	0.320	80.0
T33	Transformer				0.250	0.204	81.6	0.200	80.0
T40	Transformer				0.250	0.204	81.6	0.200	80.0
T41	Transformer				0.100	0.082	81.6	0.080	80.0
T42	Transformer				0.100	0.082	81.7	0.080	80.0
T43	Transformer				0.025	0.020	81.7	0.020	80.0
T44	Transformer				0.160	0.131	81.7	0.128	80.0
T45	Transformer				0.315	0.257	81.7	0.252	80.0
T46	Transformer				0.100	0.082	81.7	0.080	80.0
T47	Transformer				0.200	0.163	81.7	0.160	80.0
T48	Transformer				0.250	0.204	81.7	0.200	80.0
T49	Transformer				0.100	0.082	81.7	0.080	80.0

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 8
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

CKT / Branch		Cable & Reactor			Transformer				
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	Loading (input)		Loading (output)	
						MVA	%	MVA	%
T50	Transformer				0.100	0.082	81.7	0.080	80.0
T51	Transformer				0.025	0.020	81.7	0.020	80.0
T54	Transformer				0.315	0.257	81.7	0.252	80.0
T55	Transformer				0.250	0.204	81.7	0.200	80.0
T58	Transformer				0.100	0.082	81.7	0.080	80.0
T59	Transformer				0.100	0.082	81.7	0.080	80.0
T61	Transformer				0.160	0.131	81.7	0.128	80.0
T62	Transformer				0.200	0.163	81.7	0.160	80.0
T63	Transformer				0.315	0.257	81.7	0.252	80.0
T73	Transformer				0.200	0.163	81.7	0.160	80.0
T74	Transformer				0.025	0.020	81.7	0.020	80.0
T75	Transformer				0.315	0.257	81.7	0.252	80.0
T76	Transformer				0.050	0.041	81.7	0.040	80.0
T77	Transformer				0.250	0.204	81.7	0.200	80.0
T78	Transformer				0.250	0.204	81.7	0.200	80.0
T79	Transformer				0.200	0.163	81.7	0.160	80.0
T82	Transformer				0.100	0.082	81.7	0.080	80.0
T83	Transformer				0.400	0.327	81.7	0.320	80.0
T89	Transformer				0.100	0.082	81.7	0.080	80.0
T90	Transformer				0.315	0.257	81.7	0.252	80.0
T91	Transformer				0.160	0.131	81.7	0.128	80.0
T92	Transformer				0.200	0.163	81.7	0.160	80.0
T93	Transformer				0.050	0.041	81.7	0.040	80.0
T95	Transformer				0.100	0.082	81.7	0.080	80.0
T98	Transformer				0.100	0.082	81.7	0.080	80.0
T99	Transformer				0.100	0.082	81.7	0.080	80.0
T108	Transformer				0.315	0.258	81.7	0.252	80.0
T109	Transformer				0.100	0.082	81.7	0.080	80.0
T113	Transformer				0.100	0.082	81.7	0.080	80.0
T114	Transformer				0.100	0.082	81.7	0.080	80.0
T116	Transformer				0.100	0.082	81.7	0.080	80.0
T117	Transformer				0.100	0.082	81.7	0.080	80.0
T118	Transformer				0.100	0.082	81.7	0.080	80.0
T119	Transformer				0.100	0.082	81.7	0.080	80.0
T123	Transformer				0.160	0.131	81.8	0.128	80.0

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 9
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

CKT / Branch		Cable & Reactor			Transformer				
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	Loading (input)		Loading (output)	
						MVA	%	MVA	%
T124	Transformer				0.100	0.082	81.8	0.080	80.0
T125	Transformer				0.315	0.258	81.8	0.252	80.0
T133	Transformer				0.100	0.082	81.8	0.080	80.0
T134	Transformer				0.250	0.205	81.8	0.200	80.0
T135	Transformer				0.100	0.082	81.8	0.080	80.0
T136	Transformer				0.100	0.082	81.8	0.080	80.0
T137	Transformer				0.250	0.205	81.9	0.200	80.0
T138	Transformer				0.100	0.082	81.9	0.080	80.0
T139	Transformer				0.100	0.082	81.8	0.080	80.0
T142	Transformer				0.100	0.082	81.8	0.080	80.0
T143	Transformer				0.250	0.205	81.8	0.200	80.0
T147	Transformer				0.050	0.041	81.8	0.040	80.0
T148	Transformer				0.050	0.041	81.8	0.040	80.0
T149	Transformer				0.050	0.041	81.8	0.040	80.0
T151	Transformer				0.160	0.131	81.9	0.128	80.0
T160	Transformer				0.050	0.041	81.9	0.040	80.0
T161	Transformer				0.100	0.082	81.9	0.080	80.0
T162	Transformer				0.100	0.082	81.9	0.080	80.0
T163	Transformer				0.050	0.041	81.9	0.040	80.0
T164	Transformer				0.050	0.041	81.9	0.040	80.0
T165	Transformer				0.050	0.041	81.9	0.040	80.0
T166	Transformer				0.050	0.041	81.9	0.040	80.0
T167	Transformer				0.100	0.082	81.9	0.080	80.0
TAS	Transformer				0.250	0.204	81.6	0.200	80.0

* Indicates a branch with operating load exceeding the branch capability.

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 10
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Branch Losses Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd	
	ID	MW	Mvar	MW	Mvar	kW	kvar	From	To	% Drop in Vmag
T1		-0.109	-0.067	0.109	0.073	0.1	5.2	89.1	91.1	2.01
Line1		-0.109	-0.073	0.109	0.072	0.0	-0.1	91.1	91.1	0.00
T3		-0.170	-0.105	0.170	0.113	0.2	8.1	89.1	91.1	2.01
Line2		-0.279	-0.186	0.279	0.186	0.0	-0.3	91.1	91.1	0.01
T4		-0.109	-0.067	0.109	0.073	0.1	5.2	89.1	91.1	2.01
Line3		-0.388	-0.258	0.388	0.258	0.1	-0.6	91.1	91.1	0.02
T6		-0.034	-0.021	0.034	0.023	0.0	1.6	89.1	91.1	2.01
Line19		-0.422	-0.280	0.422	0.280	0.0	-0.1	91.1	91.1	0.00
TAS		-0.170	-0.105	0.170	0.112	0.2	7.1	94.8	96.7	1.88
Line5		10.120	6.748	-10.113	-6.740	7.2	8.0	96.7	96.6	0.08
Line147		-10.291	-6.860	10.302	6.872	11.0	12.2	96.7	96.9	0.13
T8		-0.068	-0.042	0.068	0.045	0.1	2.9	94.8	96.6	1.88
Line149		10.045	6.695	-10.034	-6.682	11.0	12.2	96.6	96.5	0.13
T10		-0.170	-0.105	0.170	0.113	0.2	7.2	94.5	96.4	1.89
Line7		-7.915	-5.306	7.922	5.314	6.9	7.6	96.4	96.5	0.10
Line8		7.745	5.194	-7.737	-5.185	8.0	8.8	96.4	96.3	0.12
T11		-0.136	-0.084	0.136	0.090	0.1	5.7	94.4	96.3	1.89
Line27		7.601	5.095	-7.559	-5.050	41.5	45.5	96.3	95.7	0.64
T12		-0.109	-0.067	0.109	0.072	0.1	4.6	94.6	96.5	1.89
Line6		-2.111	-1.368	2.112	1.368	0.8	0.5	96.5	96.5	0.04
Line10		2.002	1.296	-2.002	-1.295	0.8	0.6	96.5	96.4	0.05
T13		-0.068	-0.042	0.068	0.045	0.1	2.9	94.5	96.4	1.89
Line12		1.934	1.250	-1.933	-1.250	0.9	0.6	96.4	96.4	0.05
T15		-0.136	-0.084	0.136	0.090	0.1	5.7	94.5	96.4	1.89
Line148		1.797	1.160	-1.778	-1.149	18.6	10.8	96.4	95.2	1.22
T16		-0.068	-0.042	0.068	0.045	0.1	2.9	93.2	95.1	1.92
Line13		-1.267	-0.814	1.267	0.814	0.2	0.0	95.1	95.2	0.01
Line16		1.199	0.769	-1.158	-0.768	41.5	0.4	95.1	91.1	3.99
T18		-0.068	-0.042	0.068	0.045	0.1	3.2	89.1	91.1	2.01
Line18		1.090	0.723	-1.089	-0.723	0.3	0.0	91.1	91.1	0.03
T20		-0.214	-0.133	0.214	0.143	0.2	10.2	89.1	91.1	2.01
Line20		0.453	0.300	-0.453	-0.300	0.1	-0.3	91.1	91.1	0.01
T21		-0.214	-0.133	0.214	0.143	0.2	10.2	89.1	91.1	2.01
Line21		0.068	0.045	-0.068	-0.045	0.0	-0.6	91.1	91.1	0.00
Line22		0.170	0.113	-0.170	-0.113	0.0	-0.8	91.1	91.1	0.01

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 11
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
T22	-0.068	-0.042	0.068	0.045	0.1	3.2	89.1	91.1	2.01
T23	-0.170	-0.105	0.170	0.113	0.2	8.1	89.1	91.1	2.01
T24	-0.170	-0.105	0.170	0.113	0.2	7.4	93.2	95.2	1.92
Line14	-0.510	-0.335	0.510	0.335	0.0	-0.1	95.2	95.2	0.00
Line23	0.340	0.222	-0.340	-0.223	0.0	-0.5	95.2	95.1	0.01
T25	-0.272	-0.169	0.272	0.180	0.3	11.8	93.2	95.1	1.92
Line24	0.068	0.043	-0.068	-0.043	0.0	-0.3	95.1	95.1	0.00
T26	-0.068	-0.042	0.068	0.043	0.0	0.7	94.7	95.1	0.46
T29	-0.214	-0.133	0.214	0.142	0.2	9.2	93.7	95.7	1.90
Line26	6.891	4.604	-6.881	-4.593	9.8	10.7	95.5	95.3	0.17
Line28	0.443	0.292	-0.442	-0.292	0.1	-0.6	95.5	95.5	0.02
Line150	-7.334	-4.896	7.345	4.908	11.1	12.2	95.5	95.7	0.18
Line29	0.170	0.112	-0.170	-0.113	0.0	-0.7	95.5	95.4	0.01
T31	0.272	0.180	-0.272	-0.169	0.3	11.7	95.5	93.5	1.91
T33	0.170	0.113	-0.170	-0.105	0.2	7.3	95.4	93.5	1.91
T40	-0.170	-0.105	0.170	0.113	0.2	7.3	93.4	95.3	1.91
T41	-0.068	-0.042	0.068	0.045	0.1	2.9	93.3	95.2	1.91
Line35	-6.619	-4.409	6.638	4.430	19.2	20.9	94.9	95.2	0.33
Line37	6.551	4.364	-6.546	-4.358	5.4	5.8	94.9	94.8	0.09
T42	0.068	0.045	-0.068	-0.042	0.1	3.0	94.9	93.0	1.92
Line36	-6.706	-4.475	6.711	4.480	4.7	5.2	95.2	95.3	0.08
T43	-0.017	-0.011	0.017	0.011	0.0	0.7	92.9	94.8	1.92
T44	-0.109	-0.067	0.109	0.072	0.1	4.8	92.8	94.7	1.93
Line38	-6.410	-4.265	6.415	4.270	4.6	5.0	94.6	94.7	0.08
Line42	6.196	4.123	-6.195	-4.121	1.4	1.5	94.6	94.6	0.03
T45	0.214	0.142	-0.214	-0.133	0.2	9.4	94.6	92.7	1.93
Line39	-6.524	-4.342	6.529	4.347	4.8	5.2	94.7	94.8	0.08
T46	-0.068	-0.042	0.068	0.045	0.1	3.0	92.7	94.6	1.93
T47	-0.136	-0.084	0.136	0.090	0.1	6.0	92.4	94.4	1.93
Line40	-5.974	-3.968	5.977	3.971	2.8	3.1	94.3	94.4	0.05
Line43	5.804	3.855	-5.800	-3.851	3.5	3.8	94.3	94.2	0.07
T48	0.170	0.113	-0.170	-0.105	0.2	7.5	94.3	92.4	1.93
Line41	-6.113	-4.061	6.127	4.076	13.9	15.0	94.4	94.6	0.26
T49	-0.068	-0.042	0.068	0.045	0.1	3.0	92.3	94.2	1.94
T50	-0.068	-0.042	0.068	0.045	0.1	3.0	92.3	94.2	1.94
Line44	-5.276	-3.502	5.279	3.505	2.9	3.1	94.2	94.2	0.06
Line49	0.596	0.394	-0.596	-0.394	0.1	-0.3	94.2	94.1	0.02

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 12
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line50	4.663	3.097	-4.642	-3.075	20.8	21.9	94.2	93.6	0.51
T51	0.017	0.011	-0.017	-0.011	0.0	0.8	94.2	92.2	1.94
Line45	-5.347	-3.550	5.347	3.551	0.2	0.2	94.2	94.2	0.00
Line151	5.732	3.806	-5.732	-3.806	0.2	0.2	94.2	94.2	0.00
T54	-0.214	-0.133	0.214	0.142	0.2	9.5	92.3	94.2	1.94
Line46	-0.385	-0.255	0.385	0.255	0.0	0.0	94.2	94.2	0.00
Line48	0.170	0.113	-0.170	-0.113	0.0	-0.1	94.2	94.2	0.00
T55	0.170	0.113	-0.170	-0.105	0.2	7.5	94.2	92.3	1.94
T58	-0.068	-0.042	0.068	0.045	0.1	3.0	92.2	94.1	1.94
Line52	0.068	0.045	-0.068	-0.045	0.0	-0.4	94.1	94.1	0.00
Line53	-0.487	-0.322	0.487	0.322	0.1	-0.3	94.1	94.1	0.01
Line54	0.351	0.232	-0.351	-0.232	0.0	-0.3	94.1	94.1	0.01
T59	0.068	0.045	-0.068	-0.042	0.1	3.0	94.1	92.2	1.94
T61	0.109	0.072	-0.109	-0.067	0.1	4.8	94.1	92.2	1.94
Line55	0.214	0.142	-0.214	-0.142	0.0	-0.4	94.1	94.1	0.01
T62	0.136	0.090	-0.136	-0.084	0.1	6.0	94.1	92.2	1.94
T63	0.214	0.142	-0.214	-0.133	0.2	9.5	94.1	92.2	1.94
T73	-0.136	-0.084	0.136	0.090	0.1	6.1	91.7	93.6	1.95
T74	-0.017	-0.011	0.017	0.011	0.0	0.8	91.7	93.6	1.95
Line62	4.625	3.064	-4.625	-3.064	0.1	0.1	93.6	93.6	0.00
Line63	4.489	2.974	-4.481	-2.965	8.5	8.9	93.6	93.4	0.21
T75	-0.214	-0.133	0.214	0.142	0.2	9.7	91.4	93.3	1.96
T76	-0.034	-0.021	0.034	0.023	0.0	1.5	91.3	93.3	1.96
T77	-0.170	-0.105	0.170	0.113	0.2	7.7	91.1	93.1	1.96
T78	-0.170	-0.105	0.170	0.113	0.2	7.7	91.1	93.0	1.96
Line64	-3.911	-2.581	3.914	2.584	2.7	2.7	93.0	93.1	0.08
Line70	0.340	0.225	-0.340	-0.226	0.0	-0.2	93.0	93.0	0.00
Line71	3.400	2.242	-3.399	-2.241	1.1	1.1	93.0	93.0	0.04
Line65	-4.084	-2.697	4.089	2.702	5.6	5.8	93.1	93.3	0.15
Line66	-4.123	-2.725	4.126	2.727	2.4	2.4	93.3	93.3	0.06
Line67	-4.340	-2.870	4.344	2.874	4.3	4.5	93.3	93.4	0.11
T79	0.136	0.090	-0.136	-0.084	0.1	6.1	93.4	91.5	1.95
T82	-0.068	-0.042	0.068	0.045	0.1	3.1	91.0	93.0	1.96
Line69	-0.068	-0.045	0.068	0.045	0.0	-0.6	93.0	93.0	0.00
T83	0.272	0.181	-0.272	-0.169	0.3	12.3	93.0	91.1	1.96
T89	-0.068	-0.042	0.068	0.045	0.1	3.1	90.9	92.8	1.97
T90	-0.214	-0.133	0.214	0.143	0.2	9.8	90.8	92.8	1.97

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 13
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
T91	-0.109	-0.067	0.109	0.072	0.1	5.0	90.7	92.7	1.97
T92	-0.136	-0.084	0.136	0.091	0.1	6.2	90.6	92.6	1.97
Line76	-2.895	-1.905	2.897	1.907	1.9	1.8	92.6	92.7	0.07
Line83	2.759	1.814	-2.757	-1.813	1.3	1.2	92.6	92.5	0.05
Line77	-3.006	-1.979	3.009	1.982	3.5	3.4	92.7	92.8	0.13
Line78	-3.292	-2.168	3.293	2.169	1.6	1.6	92.8	92.8	0.05
Line80	0.068	0.043	-0.068	-0.045	0.0	-2.4	92.8	92.8	0.01
Line79	-3.361	-2.215	3.365	2.219	4.0	3.9	92.8	93.0	0.13
T93	0.034	0.023	-0.034	-0.021	0.0	1.5	93.0	91.0	1.96
T95	-0.068	-0.042	0.068	0.045	0.1	3.1	90.8	92.8	1.97
T98	-0.068	-0.042	0.068	0.045	0.1	3.1	90.6	92.5	1.98
Line85	1.151	0.763	-1.151	-0.763	0.4	0.0	92.5	92.5	0.04
Line108	1.538	1.005	-1.511	-0.991	26.7	13.5	92.5	90.6	1.95
Line95	1.083	0.718	-1.083	-0.718	0.2	0.0	92.5	92.5	0.03
T99	0.068	0.045	-0.068	-0.042	0.1	3.1	92.5	90.5	1.98
T108	-0.214	-0.133	0.214	0.143	0.2	9.9	90.5	92.4	1.98
T109	-0.068	-0.042	0.068	0.045	0.1	3.1	90.5	92.5	1.98
Line93	1.015	0.673	-1.014	-0.673	0.2	-0.1	92.5	92.4	0.03
Line94	0.800	0.530	-0.800	-0.530	0.1	-0.2	92.4	92.4	0.02
T113	-0.068	-0.042	0.068	0.045	0.1	3.1	90.4	92.4	1.98
Line97	0.068	0.045	-0.068	-0.045	0.0	-0.4	92.4	92.4	0.00
Line99	0.664	0.440	-0.664	-0.441	0.1	-0.2	92.4	92.4	0.01
T114	0.068	0.045	-0.068	-0.042	0.1	3.1	92.4	90.4	1.98
Line100	0.136	0.090	-0.136	-0.090	0.0	-0.3	92.4	92.4	0.00
Line102	0.460	0.305	-0.459	-0.305	0.0	-0.1	92.4	92.4	0.01
T116	0.068	0.045	-0.068	-0.042	0.1	3.1	92.4	90.4	1.98
Line101	0.068	0.045	-0.068	-0.045	0.0	-0.1	92.4	92.4	0.00
T117	0.068	0.045	-0.068	-0.042	0.1	3.1	92.4	90.4	1.98
T118	0.068	0.045	-0.068	-0.042	0.1	3.1	92.4	90.4	1.98
Line107	0.391	0.260	-0.391	-0.260	0.0	-0.1	92.4	92.4	0.00
T119	0.068	0.045	-0.068	-0.042	0.1	3.1	92.4	90.4	1.98
T123	-0.109	-0.067	0.109	0.072	0.1	5.0	90.4	92.4	1.98
T124	-0.068	-0.042	0.068	0.045	0.1	3.1	90.4	92.4	1.98
Line105	-0.068	-0.045	0.068	0.045	0.0	-0.1	92.4	92.4	0.00
Line106	-0.177	-0.118	0.177	0.118	0.0	-0.1	92.4	92.4	0.00
T125	0.214	0.143	-0.214	-0.133	0.2	9.9	92.4	90.4	1.98
T133	-0.068	-0.042	0.068	0.045	0.1	3.3	88.6	90.6	2.02

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 14
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
T134	-0.170	-0.105	0.170	0.114	0.2	8.2	88.6	90.6	2.02
Line115	1.341	0.878	-1.341	-0.878	0.1	0.0	90.6	90.6	0.01
Line116	1.273	0.832	-1.273	-0.832	0.1	0.0	90.6	90.6	0.01
T135	-0.068	-0.042	0.068	0.045	0.1	3.3	88.5	90.6	2.02
T136	-0.068	-0.042	0.068	0.045	0.1	3.3	88.1	90.1	2.03
T137	-0.170	-0.105	0.170	0.114	0.2	8.3	87.7	89.8	2.04
T138	-0.068	-0.042	0.068	0.045	0.1	3.3	87.7	89.8	2.04
Line117	-0.552	-0.362	0.552	0.362	0.1	-0.2	89.8	89.8	0.01
Line129	0.484	0.317	-0.484	-0.320	0.7	-3.3	89.8	89.6	0.16
Line118	-0.723	-0.476	0.725	0.472	2.4	-3.4	89.8	90.1	0.36
Line119	-0.793	-0.518	0.796	0.515	3.0	-3.1	90.1	90.6	0.41
Line120	-1.204	-0.787	1.205	0.787	0.1	0.0	90.6	90.6	0.01
Line121	0.340	0.227	-0.340	-0.227	0.0	-0.1	90.6	90.6	0.00
T139	0.068	0.045	-0.068	-0.042	0.1	3.3	90.6	88.5	2.02
T142	-0.068	-0.042	0.068	0.045	0.1	3.3	88.5	90.6	2.02
Line123	-0.068	-0.045	0.068	0.045	0.0	-0.1	90.6	90.6	0.00
Line124	0.102	0.068	-0.102	-0.068	0.0	-0.1	90.6	90.6	0.00
T143	0.170	0.114	-0.170	-0.105	0.2	8.2	90.6	88.5	2.02
T148	-0.034	-0.021	0.034	0.023	0.0	1.6	88.5	90.6	2.02
T149	-0.034	-0.021	0.034	0.023	0.0	1.6	88.5	90.6	2.02
Line127	0.068	0.045	-0.068	-0.045	0.0	-0.1	90.6	90.6	0.00
Line128	0.034	0.023	-0.034	-0.023	0.0	-0.1	90.6	90.6	0.00
T147	0.034	0.023	-0.034	-0.021	0.0	1.6	90.6	88.5	2.02
T151	-0.109	-0.067	0.109	0.073	0.1	5.3	87.6	89.6	2.05
Line144	0.375	0.247	-0.374	-0.249	0.2	-1.4	89.6	89.6	0.05
T160	-0.034	-0.021	0.034	0.023	0.0	1.7	87.5	89.6	2.05
T161	-0.068	-0.042	0.068	0.045	0.1	3.3	87.5	89.6	2.05
Line137	0.306	0.203	-0.306	-0.203	0.0	-0.1	89.6	89.6	0.00
Line138	0.272	0.181	-0.272	-0.181	0.0	-0.1	89.6	89.6	0.00
T162	-0.068	-0.042	0.068	0.045	0.1	3.3	87.5	89.6	2.05
T163	-0.034	-0.021	0.034	0.023	0.0	1.7	87.5	89.6	2.05
T164	-0.034	-0.021	0.034	0.023	0.0	1.7	87.5	89.6	2.05
T165	-0.034	-0.021	0.034	0.023	0.0	1.7	87.5	89.5	2.05
Line139	0.068	0.045	-0.068	-0.045	0.0	-0.6	89.5	89.5	0.00
Line140	-0.102	-0.068	0.102	0.068	0.0	-0.1	89.5	89.6	0.00
Line141	-0.136	-0.090	0.136	0.090	0.0	-0.2	89.6	89.6	0.00
Line142	-0.170	-0.113	0.170	0.113	0.0	-0.2	89.6	89.6	0.00

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd
	MW	Mvar	MW	Mvar	kW	kvar	From	To	% Drop in Vmag
Line143	-0.238	-0.158	0.238	0.158	0.0	-0.1	89.6	89.6	0.00
T166	0.034	0.023	-0.034	-0.021	0.0	1.7	89.6	87.5	2.05
T167	-0.068	-0.042	0.068	0.045	0.1	3.3	87.5	89.5	2.05
T7	-10.302	-6.872	10.317	7.553	15.1	681.0	96.9	100.0	3.15
					351.3	1377.3			

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 16
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Alert Summary Report

% Alert Settings

<u>Loading</u>	<u>Critical</u>	<u>Marginal</u>
Bus	100.0	95.0
Cable	100.0	95.0
Reactor	100.0	95.0
Line	100.0	95.0
Transformer	100.0	95.0
Panel	100.0	95.0
Protective Device	100.0	95.0
Generator	100.0	95.0
Inverter/Charger	100.0	95.0
<u>Bus Voltage</u>		
OverVoltage	105.0	102.0
UnderVoltage	90.0	93.0
<u>Generator Excitation</u>		
OverExcited (Q Max.)	100.0	95.0
UnderExcited (Q Min.)	100.0	

Critical Report

<u>Device ID</u>	<u>Type</u>	<u>Condition</u>	<u>Rating/Limit</u>	<u>Unit</u>	<u>Operating</u>	<u>% Operating</u>	<u>Phase Type</u>
Bus1	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus11	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus264	Bus	Under Voltage	0.400	kV	0.354	88.6	3-Phase
Bus265	Bus	Under Voltage	0.400	kV	0.354	88.6	3-Phase
Bus268	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase
Bus269	Bus	Under Voltage	0.400	kV	0.352	88.1	3-Phase
Bus270	Bus	Under Voltage	0.400	kV	0.351	87.7	3-Phase
Bus271	Bus	Under Voltage	0.400	kV	0.351	87.7	3-Phase
Bus272	Bus	Under Voltage	20.000	kV	17.955	89.8	3-Phase
Bus273	Bus	Under Voltage	20.000	kV	17.958	89.8	3-Phase
Bus277	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase
Bus282	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase
Bus285	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase
Bus291	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase
Bus292	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 17
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Critical Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
Bus296	Bus	Under Voltage	0.400	kV	0.354	88.5	3-Phase
Bus299	Bus	Under Voltage	0.400	kV	0.350	87.6	3-Phase
Bus300	Bus	Under Voltage	20.000	kV	17.922	89.6	3-Phase
Bus317	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus318	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus319	Bus	Under Voltage	20.000	kV	17.913	89.6	3-Phase
Bus320	Bus	Under Voltage	20.000	kV	17.912	89.6	3-Phase
Bus321	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus322	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus323	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus324	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus325	Bus	Under Voltage	20.000	kV	17.910	89.5	3-Phase
Bus326	Bus	Under Voltage	20.000	kV	17.910	89.6	3-Phase
Bus327	Bus	Under Voltage	20.000	kV	17.911	89.6	3-Phase
Bus328	Bus	Under Voltage	20.000	kV	17.911	89.6	3-Phase
Bus329	Bus	Under Voltage	20.000	kV	17.911	89.6	3-Phase
Bus330	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus331	Bus	Under Voltage	0.400	kV	0.350	87.5	3-Phase
Bus332	Bus	Under Voltage	20.000	kV	17.909	89.5	3-Phase
Bus37	Bus	Under Voltage	0.400	kV	0.357	89.1	3-Phase
Bus41	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus43	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus45	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus47	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus5	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase
Bus7	Bus	Under Voltage	0.400	kV	0.356	89.1	3-Phase

Marginal Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
Bus103	Bus	Under Voltage	0.400	kV	0.369	92.2	3-Phase
Bus108	Bus	Under Voltage	0.400	kV	0.369	92.3	3-Phase
Bus111	Bus	Under Voltage	0.400	kV	0.369	92.3	3-Phase
Bus116	Bus	Under Voltage	0.400	kV	0.369	92.2	3-Phase
Bus119	Bus	Under Voltage	0.400	kV	0.369	92.2	3-Phase
Bus12	Bus	Under Voltage	20.000	kV	18.223	91.1	3-Phase
Bus122	Bus	Under Voltage	0.400	kV	0.369	92.2	3-Phase

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 18
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Marginal Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
Bus124	Bus	Under Voltage	0.400	kV	0.369	92.2	3-Phase
Bus126	Bus	Under Voltage	0.400	kV	0.369	92.2	3-Phase
Bus145	Bus	Under Voltage	0.400	kV	0.367	91.7	3-Phase
Bus146	Bus	Under Voltage	0.400	kV	0.367	91.7	3-Phase
Bus149	Bus	Under Voltage	0.400	kV	0.365	91.4	3-Phase
Bus150	Bus	Under Voltage	0.400	kV	0.365	91.3	3-Phase
Bus151	Bus	Under Voltage	0.400	kV	0.365	91.1	3-Phase
Bus152	Bus	Under Voltage	0.400	kV	0.364	91.1	3-Phase
Bus158	Bus	Under Voltage	0.400	kV	0.366	91.5	3-Phase
Bus163	Bus	Under Voltage	0.400	kV	0.364	91.0	3-Phase
Bus166	Bus	Under Voltage	0.400	kV	0.364	91.1	3-Phase
Bus177	Bus	Under Voltage	0.400	kV	0.364	90.9	3-Phase
Bus178	Bus	Under Voltage	0.400	kV	0.363	90.8	3-Phase
Bus179	Bus	Under Voltage	0.400	kV	0.363	90.7	3-Phase
Bus180	Bus	Under Voltage	0.400	kV	0.362	90.6	3-Phase
Bus181	Bus	Under Voltage	20.000	kV	18.518	92.6	3-Phase
Bus182	Bus	Under Voltage	20.000	kV	18.533	92.7	3-Phase
Bus183	Bus	Under Voltage	20.000	kV	18.559	92.8	3-Phase
Bus184	Bus	Under Voltage	20.000	kV	18.570	92.8	3-Phase
Bus185	Bus	Under Voltage	20.000	kV	18.596	93.0	3-Phase
Bus186	Bus	Under Voltage	0.400	kV	0.364	91.0	3-Phase
Bus189	Bus	Under Voltage	0.400	kV	0.363	90.8	3-Phase
Bus190	Bus	Under Voltage	20.000	kV	18.557	92.8	3-Phase
Bus194	Bus	Under Voltage	0.400	kV	0.362	90.6	3-Phase
Bus195	Bus	Under Voltage	20.000	kV	18.507	92.5	3-Phase
Bus196	Bus	Under Voltage	20.000	kV	18.500	92.5	3-Phase
Bus197	Bus	Under Voltage	0.400	kV	0.362	90.5	3-Phase
Bus2	Bus	Under Voltage	20.000	kV	18.217	91.1	3-Phase
Bus214	Bus	Under Voltage	0.400	kV	0.362	90.5	3-Phase
Bus215	Bus	Under Voltage	0.400	kV	0.362	90.5	3-Phase
Bus216	Bus	Under Voltage	20.000	kV	18.494	92.5	3-Phase
Bus217	Bus	Under Voltage	20.000	kV	18.489	92.4	3-Phase
Bus224	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus225	Bus	Under Voltage	20.000	kV	18.485	92.4	3-Phase
Bus226	Bus	Under Voltage	20.000	kV	18.485	92.4	3-Phase
Bus227	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 19
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

Marginal Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
Bus230	Bus	Under Voltage	20.000	kV	18.483	92.4	3-Phase
Bus231	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus232	Bus	Under Voltage	20.000	kV	18.482	92.4	3-Phase
Bus233	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus234	Bus	Under Voltage	20.000	kV	18.482	92.4	3-Phase
Bus235	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus236	Bus	Under Voltage	20.000	kV	18.482	92.4	3-Phase
Bus237	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus244	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus245	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus246	Bus	Under Voltage	20.000	kV	18.481	92.4	3-Phase
Bus247	Bus	Under Voltage	20.000	kV	18.481	92.4	3-Phase
Bus248	Bus	Under Voltage	20.000	kV	18.481	92.4	3-Phase
Bus249	Bus	Under Voltage	0.400	kV	0.362	90.4	3-Phase
Bus266	Bus	Under Voltage	20.000	kV	18.117	90.6	3-Phase
Bus267	Bus	Under Voltage	20.000	kV	18.115	90.6	3-Phase
Bus274	Bus	Under Voltage	20.000	kV	18.029	90.1	3-Phase
Bus275	Bus	Under Voltage	20.000	kV	18.111	90.6	3-Phase
Bus276	Bus	Under Voltage	20.000	kV	18.113	90.6	3-Phase
Bus283	Bus	Under Voltage	20.000	kV	18.111	90.6	3-Phase
Bus284	Bus	Under Voltage	20.000	kV	18.111	90.6	3-Phase
Bus293	Bus	Under Voltage	20.000	kV	18.111	90.6	3-Phase
Bus294	Bus	Under Voltage	20.000	kV	18.111	90.6	3-Phase
Bus295	Bus	Under Voltage	20.000	kV	18.111	90.6	3-Phase
Bus38	Bus	Under Voltage	20.000	kV	18.229	91.1	3-Phase
Bus42	Bus	Under Voltage	20.000	kV	18.223	91.1	3-Phase
Bus44	Bus	Under Voltage	20.000	kV	18.221	91.1	3-Phase
Bus46	Bus	Under Voltage	20.000	kV	18.220	91.1	3-Phase
Bus48	Bus	Under Voltage	20.000	kV	18.219	91.1	3-Phase
Bus6	Bus	Under Voltage	20.000	kV	18.217	91.1	3-Phase
Bus8	Bus	Under Voltage	20.000	kV	18.219	91.1	3-Phase
Bus85	Bus	Under Voltage	0.400	kV	0.372	92.9	3-Phase
Bus86	Bus	Under Voltage	0.400	kV	0.371	92.8	3-Phase
Bus90	Bus	Under Voltage	0.400	kV	0.371	92.7	3-Phase
Bus91	Bus	Under Voltage	0.400	kV	0.372	93.0	3-Phase
Bus92	Bus	Under Voltage	0.400	kV	0.371	92.7	3-Phase

Project:

Location:

Contract:

Engineer:

Filename: widia

ETAP

12.6.0H

Study Case: LF

Page: 20

Date: 08-21-2018

SN:

Revision: Base

Config.: Normal

Marginal Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
Bus93	Bus	Under Voltage	0.400	kV	0.370	92.4	3-Phase
Bus97	Bus	Under Voltage	0.400	kV	0.369	92.4	3-Phase
Bus98	Bus	Under Voltage	0.400	kV	0.369	92.3	3-Phase
Bus99	Bus	Under Voltage	0.400	kV	0.369	92.3	3-Phase

Project:
Location:
Contract:
Engineer:
Filename: widia

ETAP
12.6.0H

Study Case: LF

Page: 21
Date: 08-21-2018
SN:
Revision: Base
Config.: Normal

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Source (Swing Buses):	10.317	7.553	12.786	80.69 Lagging
Source (Non-Swing Buses):	0.000	0.000	0.000	
Total Demand:	10.317	7.553	12.786	80.69 Lagging
Total Motor Load:	9.965	6.176	11.724	85.00 Lagging
Total Static Load:	0.000	0.000	0.000	
Total Constant I Load:	0.000	0.000	0.000	
Total Generic Load:	0.000	0.000	0.000	
Apparent Losses:	0.351	1.377		
System Mismatch:	0.000	0.000		

Number of Iterations: 4