

LAMPIRAN 2

Losses sebelum intgrasi PLTS

Project:	ETAP	Page:	1
Location:	12.6.0H	Date:	07-14-2022
Contract:		SN:	
Engineer:	Study Case: LF	Revision:	Base
Filename:	LONGGINUS NACIMENTO	Config.:	Normal

Branch Losses Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
T1	5.053	3.063	-5.052	-3.019	1.0	43.6	100.0	99.6	0.39
Line1	0.904	0.525	-0.902	-0.525	2.1	-0.6	99.6	99.4	0.24
Line22	4.149	2.404	-4.104	-2.464	44.5	30.9	99.6	98.5	1.13
Line3	0.127	0.075	-0.127	-0.077	0.0	-2.1	99.4	99.3	0.03
Line5	0.690	0.398	-0.688	-0.399	1.2	-1.3	99.4	99.2	0.19
Line2	-3.728	-2.225	3.767	2.252	39.2	27.1	95.2	96.2	1.06
Line27	0.796	0.472	-0.794	-0.473	1.8	-0.7	95.2	95.0	0.23
Line38	2.932	1.753	-2.908	-1.737	24.3	16.0	95.2	94.3	0.84
Line4	0.085	0.050	-0.085	-0.053	0.0	-2.1	99.3	99.3	0.02
Line6	0.604	0.347	-0.603	-0.348	0.9	-1.5	99.2	99.0	0.16
Line10	0.518	0.296	-0.517	-0.297	0.7	-1.6	99.0	98.9	0.14
Line11	0.475	0.271	-0.474	-0.273	0.6	-1.7	98.9	98.7	0.13
Line12	0.432	0.247	-0.432	-0.249	0.5	-1.8	98.7	98.6	0.12
Line13	0.042	0.024	-0.042	-0.026	0.0	-2.1	98.6	98.6	0.01
Line14	0.042	0.024	-0.042	-0.026	0.0	-2.1	98.6	98.6	0.01
Line15	0.347	0.200	-0.347	-0.202	0.3	-1.9	98.6	98.5	0.09
Line16	0.305	0.176	-0.304	-0.178	0.2	-1.9	98.5	98.4	0.08
Line17	0.262	0.152	-0.262	-0.154	0.2	-2.0	98.4	98.4	0.07
Line18	0.177	0.102	-0.177	-0.104	0.1	-2.1	98.4	98.3	0.05
Line19	0.135	0.077	-0.135	-0.080	0.0	-2.1	98.3	98.3	0.04
Line20	0.135	0.082	-0.135	-0.084	0.0	-2.1	98.3	98.3	0.04
Line21	0.000	-0.002	0.000	0.000	0.0	-2.1	98.3	98.3	0.00
Line23	4.062	2.437	-4.018	-2.407	43.6	30.2	98.5	97.3	1.12
Line24	0.084	0.050	-0.084	-0.052	0.0	-2.1	97.3	97.3	0.02
Line25	3.934	2.357	-3.893	-2.328	41.8	29.0	97.3	96.2	1.10
Line26	0.084	0.050	-0.084	-0.052	0.0	-2.0	98.2	96.2	0.02
Line28	0.711	0.421	-0.709	-0.422	1.4	-0.9	95.0	94.8	0.20
Line29	0.626	0.371	-0.625	-0.372	1.1	-1.1	94.8	94.6	0.18
Line30	0.542	0.320	-0.541	-0.322	0.8	-1.3	94.6	94.4	0.16
Line31	0.291	0.171	-0.291	-0.173	0.2	-1.8	94.4	94.3	0.08
Line32	0.166	0.099	-0.166	-0.101	0.1	-1.9	94.4	94.4	0.05
Line33	0.083	0.050	-0.083	-0.052	0.0	-1.9	94.4	94.3	0.02
Line34	0.250	0.147	-0.249	-0.149	0.2	-1.8	94.3	94.3	0.07
Line35	0.166	0.097	-0.166	-0.099	0.1	-1.9	94.3	94.2	0.05
Line36	0.125	0.073	-0.125	-0.075	0.0	-1.9	94.2	94.2	0.04

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CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line37	0.042	0.024	-0.042	-0.026	0.0	-1.9	94.2	94.2	0.01
Line39	2.775	1.654	-2.753	-1.640	22.1	14.5	94.3	93.5	0.80
Line40	0.166	0.097	-0.166	-0.099	0.1	-1.9	93.5	93.5	0.05
Line43	2.587	1.543	-2.567	-1.530	19.5	12.6	93.5	92.8	0.75
Line41	0.124	0.073	-0.124	-0.075	0.0	-1.9	93.5	93.5	0.04
Line42	0.041	0.024	-0.041	-0.026	0.0	-1.9	93.5	93.5	0.01
Line44	0.083	0.049	-0.083	-0.051	0.0	-1.9	92.8	92.8	0.02
Line45	2.485	1.481	-2.466	-1.469	18.3	11.7	92.8	92.1	0.73
Line46	2.425	1.444	-2.407	-1.432	17.7	11.3	92.1	91.4	0.72
Line47	0.247	0.147	-0.247	-0.149	0.2	-1.7	91.4	91.3	0.07
Line50	2.161	1.285	-2.146	-1.276	14.3	8.8	91.4	90.7	0.64
Line48	0.164	0.088	-0.164	-0.100	0.1	-1.8	91.3	91.2	0.05
Line49	0.082	0.049	-0.082	-0.051	0.0	-1.8	91.2	91.2	0.02
Line51	0.041	0.024	-0.041	-0.025	0.0	-1.8	90.7	90.7	0.01
Line52	2.105	1.252	-2.092	-1.244	13.7	8.4	90.7	90.1	0.63
Line53	2.051	1.219	-2.038	-1.211	13.2	8.0	90.1	89.5	0.62
Line54	1.956	1.160	-1.944	-1.153	12.2	7.3	89.5	88.9	0.59
Line55	1.903	1.128	-1.891	-1.121	11.7	6.9	88.9	88.3	0.58
Line56	1.851	1.095	-1.840	-1.089	11.2	6.6	88.3	87.7	0.57
Line57	0.162	0.094	-0.162	-0.095	0.1	-1.6	87.7	87.7	0.05
Line61	1.677	0.995	-1.668	-0.990	9.3	5.2	87.7	87.2	0.52
Line58	0.122	0.070	-0.122	-0.072	0.0	-1.6	87.7	87.6	0.04
Line59	0.041	0.023	-0.041	-0.025	0.0	-1.7	87.6	87.6	0.01
Line60	0.041	0.023	-0.041	-0.025	0.0	-1.7	87.6	87.6	0.01
Line62	1.221	0.729	-1.216	-0.727	5.0	2.1	87.2	86.8	0.38
Line82	0.447	0.261	-0.446	-0.282	0.7	-1.2	87.2	87.1	0.14
Line63	1.136	0.679	-1.131	-0.677	4.4	1.6	86.8	86.5	0.36
Line64	0.040	0.023	-0.040	-0.025	0.0	-1.6	86.8	86.8	0.01
Line65	1.091	0.652	-1.087	-0.651	4.1	1.4	86.5	86.1	0.34
Line66	0.926	0.554	-0.923	-0.553	3.0	0.6	86.1	85.8	0.29
Line67	0.121	0.072	-0.121	-0.073	0.1	-1.6	86.1	86.1	0.04
Line68	0.040	0.023	-0.040	-0.025	0.0	-1.6	86.1	86.1	0.01
Line69	0.842	0.508	-0.840	-0.508	2.5	0.2	85.8	85.6	0.27
Line70	0.081	0.045	-0.081	-0.047	0.0	-1.6	85.8	85.8	0.03
Line71	0.040	0.023	-0.040	-0.025	0.0	-1.6	85.8	85.8	0.01
Line72	0.040	0.023	-0.040	-0.025	0.0	-1.6	85.8	85.8	0.01
Line73	0.719	0.436	-0.717	-0.437	1.8	-0.2	85.6	85.3	0.23

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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	
Line74	0.080	0.047	-0.080	-0.048	0.0	-1.6	85.6	85.5	0.03
Line75	0.040	0.023	-0.040	-0.025	0.0	-1.6	85.5	85.5	0.01
Line76	0.596	0.365	-0.595	-0.366	1.3	-0.7	85.3	85.1	0.19
Line77	0.121	0.072	-0.121	-0.073	0.1	-1.6	85.3	85.3	0.04
Line78	0.080	0.048	-0.080	-0.050	0.0	-1.6	85.3	85.3	0.03
Line79	0.555	0.343	-0.554	-0.343	1.1	-0.8	85.1	85.0	0.18
Line80	0.040	0.023	-0.040	-0.025	0.0	-1.6	85.1	85.1	0.01
Line83	0.365	0.212	-0.365	-0.213	0.4	-1.3	87.1	87.0	0.11
Line84	0.524	0.188	-0.524	-0.189	0.4	-1.4	87.0	86.9	0.30
Line85	0.283	0.164	-0.283	-0.166	0.3	-1.5	86.9	86.8	0.09
Line86	0.243	0.141	-0.243	-0.142	0.2	-1.5	86.8	86.7	0.08
Line87	0.202	0.117	-0.202	-0.119	0.1	-1.5	86.7	86.6	0.06
Line88	0.162	0.094	-0.162	-0.095	0.1	-1.6	86.6	86.6	0.05
Line89	0.121	0.070	-0.121	-0.072	0.0	-1.6	86.6	86.5	0.04
Line90	0.081	0.047	-0.081	-0.048	0.0	-1.6	86.5	86.5	0.03
Line91	0.040	0.023	-0.040	-0.025	0.0	-1.6	86.5	86.5	0.01
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Losse sesudah integrasi

Project:	ETAP	Page:	1
Location:	12.6.001	Date:	07-14-2022
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Filename: LONGGINUS NACIMENTO		Config.:	Normal

Branch Losses Summary Report

CKT / Branch	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
T1	0.874	0.627	-0.874	-0.626	0.0	1.4	100.0	99.9	0.08
Line1	0.905	0.525	-0.903	-0.526	2.1	-0.6	99.9	99.7	0.24
Line22	-0.031	0.101	0.031	-0.103	0.0	-2.2	99.9	99.9	0.01
Line3	0.127	0.075	-0.127	-0.077	0.0	-2.1	99.7	99.6	0.03
Line5	0.690	0.398	-0.689	-0.400	1.2	-1.3	99.7	99.5	0.19
Line2	0.286	0.045	-0.286	-0.047	0.2	-2.1	100.0	99.9	0.06
Line27	0.811	0.479	-0.809	-0.480	1.7	-0.9	100.0	99.8	0.22
Line38	2.968	1.762	-2.946	-1.748	22.4	14.5	100.0	99.2	0.81
Line4	0.085	0.050	-0.085	-0.053	0.0	-2.2	99.6	99.6	0.02
Line6	0.604	0.347	-0.603	-0.349	0.9	-1.5	99.5	99.3	0.16
Line10	0.519	0.296	-0.518	-0.298	0.7	-1.7	99.3	99.2	0.14
Line11	0.476	0.271	-0.475	-0.273	0.6	-1.7	99.2	99.1	0.13
Line12	0.433	0.247	-0.432	-0.249	0.5	-1.8	99.1	98.9	0.12
Line13	0.042	0.024	-0.042	-0.026	0.0	-2.1	98.9	98.9	0.01
Line14	0.042	0.024	-0.042	-0.026	0.0	-2.1	98.9	98.9	0.01
Line15	0.348	0.201	-0.347	-0.202	0.3	-1.9	98.9	98.8	0.09
Line16	0.305	0.176	-0.305	-0.178	0.2	-2.0	98.8	98.8	0.08
Line17	0.262	0.152	-0.262	-0.154	0.2	-2.0	98.8	98.7	0.07
Line18	0.178	0.102	-0.178	-0.104	0.1	-2.1	98.7	98.6	0.05
Line19	0.135	0.077	-0.135	-0.080	0.0	-2.1	98.6	98.6	0.04
Line20	0.135	0.082	-0.135	-0.084	0.0	-2.1	98.6	98.6	0.04
Line21	0.000	-0.002	0.000	0.000	0.0	-2.1	98.6	98.6	0.00
Line23	-0.074	0.076	0.074	-0.079	0.0	-2.2	99.9	99.9	0.00
Line24	0.085	0.050	-0.085	-0.053	0.0	-2.2	99.9	99.9	0.02
Line25	-0.159	0.028	0.159	-0.030	0.0	-2.1	99.9	99.9	0.03
Line26	0.085	0.050	-0.085	-0.053	0.0	-2.2	99.9	99.9	0.02
Line28	0.724	0.428	-0.723	-0.429	1.3	-1.2	99.8	99.6	0.20
Line29	0.638	0.376	-0.637	-0.378	1.0	-1.4	99.6	99.4	0.17
Line30	0.552	0.325	-0.551	-0.327	0.8	-1.6	99.4	99.3	0.15
Line31	0.297	0.173	-0.297	-0.175	0.2	-2.0	99.3	99.2	0.08
Line32	0.170	0.101	-0.169	-0.103	0.1	-2.1	99.3	99.2	0.05
Line33	0.085	0.050	-0.085	-0.053	0.0	-2.1	99.2	99.2	0.02
Line34	0.254	0.149	-0.254	-0.151	0.2	-2.0	99.2	99.1	0.07
Line35	0.169	0.099	-0.169	-0.101	0.1	-2.1	99.1	99.1	0.05
Line36	0.127	0.074	-0.127	-0.077	0.0	-2.1	99.1	99.0	0.03

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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	
Line37	0.042	0.024	-0.042	-0.026	0.0	-2.1	99.0	99.0	0.01
Line39	2.810	1.664	-2.790	-1.651	20.4	13.0	99.2	98.4	0.77
Line40	0.169	0.098	-0.169	-0.100	0.1	-2.1	98.4	98.4	0.05
Line43	2.621	1.552	-2.603	-1.541	18.0	11.3	98.4	97.7	0.72
Line41	0.127	0.074	-0.127	-0.076	0.0	-2.1	98.4	98.3	0.03
Line42	0.042	0.024	-0.042	-0.026	0.0	-2.1	98.3	98.3	0.01
Line44	0.084	0.050	-0.084	-0.052	0.0	-2.1	97.7	97.7	0.02
Line45	2.518	1.491	-2.501	-1.481	16.9	10.5	97.7	97.0	0.70
Line46	2.459	1.455	-2.443	-1.444	16.3	10.1	97.0	96.3	0.69
Line47	0.251	0.150	-0.251	-0.152	0.2	-1.9	96.3	96.2	0.07
Line50	2.192	1.295	-2.178	-1.287	13.2	7.7	96.3	95.7	0.62
Line48	0.168	0.100	-0.167	-0.102	0.1	-2.0	96.2	96.2	0.05
Line49	0.084	0.050	-0.084	-0.052	0.0	-2.0	96.2	96.2	0.02
Line51	0.042	0.024	-0.042	-0.026	0.0	-2.0	95.7	95.7	0.01
Line52	2.137	1.263	-2.134	-1.256	12.7	7.4	95.7	95.1	0.60
Line53	2.082	1.230	-2.070	-1.223	12.2	7.1	95.1	94.5	0.59
Line54	1.987	1.171	-1.976	-1.165	11.2	6.4	94.5	93.9	0.57
Line55	1.934	1.139	-1.923	-1.133	10.8	6.1	93.9	93.4	0.56
Line56	1.882	1.107	-1.872	-1.102	10.3	5.7	93.4	92.8	0.55
Line57	0.165	0.095	-0.165	-0.097	0.1	-1.8	92.8	92.8	0.05
Line61	1.706	1.007	-1.698	-1.002	8.6	4.5	92.8	92.3	0.50
Line58	0.124	0.071	-0.124	-0.073	0.0	-1.9	92.8	92.8	0.04
Line59	0.041	0.024	-0.041	-0.026	0.0	-1.9	92.8	92.7	0.01
Line60	0.041	0.024	-0.041	-0.026	0.0	-1.9	92.8	92.7	0.01
Line62	1.243	0.738	-1.238	-0.737	4.6	1.6	92.3	92.0	0.37
Line82	0.455	0.264	-0.454	-0.265	0.6	-1.4	92.3	92.2	0.13
Line63	1.156	0.688	-1.152	-0.686	4.0	1.1	92.0	91.6	0.34
Line64	0.041	0.024	-0.041	-0.026	0.0	-1.8	92.0	92.0	0.01
Line65	1.111	0.661	-1.107	-0.660	3.7	1.0	91.6	91.3	0.33
Line66	0.942	0.562	-0.940	-0.562	2.7	0.2	91.3	91.0	0.28
Line67	0.123	0.073	-0.123	-0.075	0.0	-1.8	91.3	91.3	0.04
Line68	0.041	0.024	-0.041	-0.025	0.0	-1.8	91.3	91.3	0.01
Line69	0.858	0.516	-0.855	-0.516	2.3	-0.1	91.0	90.8	0.26
Line70	0.082	0.045	-0.082	-0.047	0.0	-1.8	91.0	91.0	0.02
Line71	0.041	0.024	-0.041	-0.025	0.0	-1.8	91.0	91.0	0.01
Line72	0.041	0.024	-0.041	-0.025	0.0	-1.8	91.0	91.0	0.01
Line73	0.732	0.444	-0.731	-0.444	1.7	-0.6	90.8	90.5	0.22

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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	
Line74	0.082	0.047	-0.082	-0.049	0.0	-1.8	90.8	90.7	0.02
Line75	0.041	0.024	-0.041	-0.025	0.0	-1.8	90.7	90.7	0.01
Line76	0.608	0.372	-0.607	-0.372	1.2	-0.9	90.5	90.4	0.18
Line77	0.123	0.073	-0.123	-0.074	0.0	-1.8	90.5	90.5	0.04
Line78	0.082	0.049	-0.082	-0.051	0.0	-1.8	90.5	90.5	0.02
Line79	0.566	0.349	-0.565	-0.350	1.0	-1.0	90.4	90.2	0.17
Line80	0.041	0.024	-0.041	-0.025	0.0	-1.8	90.4	90.3	0.01
Line83	0.372	0.214	-0.372	-0.216	0.4	-1.6	92.2	92.1	0.11
Line84	0.330	0.190	-0.330	-0.192	0.3	-1.6	92.1	92.0	0.10
Line85	0.289	0.166	-0.289	-0.168	0.2	-1.7	92.0	91.9	0.08
Line86	0.247	0.142	-0.247	-0.144	0.2	-1.7	91.9	91.8	0.07
Line87	0.206	0.119	-0.206	-0.120	0.1	-1.8	91.8	91.8	0.06
Line88	0.165	0.095	-0.165	-0.097	0.1	-1.8	91.8	91.7	0.05
Line89	0.124	0.071	-0.123	-0.073	0.0	-1.8	91.7	91.7	0.04
Line90	0.082	0.047	-0.082	-0.049	0.0	-1.8	91.7	91.7	0.02
Line91	0.041	0.024	-0.041	-0.025	0.0	-1.8	91.7	91.7	0.01
					200.7	-17.5			

Loadflow Report

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LOAD FLOW REPORT

Bus	Voltage			Generation		Load		Load Flow				XFMR	
	ID	LV	%Mag. Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Ang	%DF	%Tap
* Bus1	70.000	100.000	0.0	4.816	2.975	0	0	Bus2	4.916	2.975	47.4	85.6	
Bus2	20.000	99.616	-0.3	0	0	0	0	Bus1	-4.915	-2.933	165.9	85.9	
								Bus3	4.915	2.933	165.9	85.9	
Bus3	20.000	99.616	-0.3	0	0	0	0	Bus4	0.766	0.441	25.6	86.7	
								Bus25	4.149	2.402	140.3	85.7	
								Bus2	-4.915	-2.933	165.9	85.9	
Bus4	20.000	99.410	-0.4	0	0	0.085	0.051	Bus3	-0.765	-0.442	25.6	86.6	
								Bus5	0.127	0.075	4.1	86.3	
								Bus8	0.555	0.315	18.5	86.9	
Bus5	20.000	95.188	-0.6	0	0	0	0	Bus28	-3.728	-2.223	131.6	85.9	
								Bus30	0.796	0.472	28.1	86.0	
								Bus41	2.932	1.753	105.6	85.8	
								Bus94	0.000	-0.002	0.1	0.0	
Bus6	20.000	99.375	-0.4	0	0	0.042	0.026	Bus4	-0.127	-0.077	4.3	85.6	
								Bus7	0.085	0.050	2.9	86.0	
Bus7	20.000	99.352	-0.4	0	0	0.085	0.051	Bus6	-0.085	-0.053	2.9	85.0	
Bus8	20.000	99.261	-0.4	0	0	0.085	0.051	Bus4	-0.552	-0.317	18.5	86.7	
								Bus9	0.467	0.264	15.6	87.1	
Bus9	20.000	99.115	-0.4	0	0	0.085	0.052	Bus8	-0.467	-0.266	15.6	86.9	
								Bus13	0.382	0.213	12.7	87.3	
Bus13	20.000	99.032	-0.4	0	0	0.042	0.026	Bus9	-0.381	-0.215	12.8	87.1	
								Bus14	0.379	0.189	11.3	87.4	
Bus14	20.000	98.941	-0.4	0	0	0.042	0.026	Bus13	-0.379	-0.191	11.3	87.1	
								Bus15	0.297	0.165	9.9	87.4	
Bus15	20.000	98.861	-0.4	0	0	0	0	Bus14	-0.296	-0.167	9.9	87.2	
								Bus16	0.042	0.024	1.4	86.9	
								Bus17	0.042	0.024	1.4	86.9	
								Bus18	0.212	0.118	7.1	87.3	
Bus16	20.000	98.849	-0.4	0	0	0.042	0.026	Bus15	-0.042	-0.026	1.5	85.0	
Bus17	20.000	98.849	-0.4	0	0	0.042	0.026	Bus15	-0.042	-0.026	1.5	85.0	
Bus18	20.000	98.804	-0.4	0	0	0.042	0.026	Bus15	-0.212	-0.120	7.1	86.9	
								Bus19	0.189	0.094	5.7	87.4	
Bus19	20.000	98.758	-0.4	0	0	0.042	0.026	Bus18	-0.189	-0.096	5.7	86.9	
								Bus20	0.127	0.070	4.2	87.5	
Bus20	20.000	98.724	-0.4	0	0	0.085	0.052	Bus19	-0.127	-0.072	4.3	86.9	
								Bus21	0.042	0.020	1.4	86.6	

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Bus		Voltage			Generation		Load		Load Flow					XFMR	
ID	kV	% Mag	Ang	MW	Mvar	MW	Mvar	ID	MW	Mvar	Ang	%F	%Tap		
Bus1	20.000	98.711	-0.4	0	0	0.042	0.026	Bus20	-0.042	-0.022	1.4	85.8			
								Bus22	0.000	-0.004	0.1	0.0			
Bus22	20.000	98.711	-0.4	0	0	0	0	Bus21	0.000	0.002	0.1	0.0			
								Bus24	0.000	-0.002	0.1	0.0			
Bus24	20.000	98.711	-0.4	0	0	0	0	Bus22	0.000	0.000	0.0	0.0			
Bus25	20.000	98.483	-0.4	0	0	0.042	0.026	Bus3	-0.194	-2.462	140.3	85.8			
								Bus26	-0.042	2.435	138.8	85.8			
Bus26	20.000	97.341	-0.5	0	0	0	0	Bus25	-0.009	-2.405	138.9	85.8			
								Bus27	0.084	0.050	2.9	85.9			
								Bus28	3.934	2.355	134.0	85.8			
Bus27	20.000	97.317	-0.5	0	0	0.084	0.052	Bus26	-0.084	-0.052	2.9	85.0			
Bus28	20.000	96.262	-0.5	0	0	0.042	0.026	Bus5	3.767	2.250	131.6	85.8			
								Bus26	-3.891	-2.326	134.0	85.8			
								Bus29	0.084	0.050	2.9	85.9			
Bus29	20.000	96.218	-0.5	0	0	0.084	0.052	Bus28	-0.084	-0.052	3.0	85.0			
Bus30	20.000	94.972	-0.6	0	0	0.083	0.052	Bus1	-0.794	-0.473	24.1	85.8			
								Bus31	0.711	0.421	25.1	86.0			
Bus31	20.000	94.589	-0.6	0	0	0.083	0.052	Bus30	-0.709	-0.422	25.1	85.9			
								Bus32	0.626	0.371	22.2	86.0			
Bus32	20.000	94.589	-0.6	0	0	0.083	0.052	Bus31	-0.625	-0.372	22.2	85.9			
								Bus33	0.542	0.320	19.2	86.1			
Bus33	20.000	94.424	-0.7	0	0	0.083	0.052	Bus32	-0.541	-0.322	19.2	85.9			
								Bus36	0.291	0.171	10.3	86.3			
								Bus34	0.166	0.099	5.9	85.9			
Bus34	20.000	94.386	-0.7	0	0	0.083	0.052	Bus33	-0.166	-0.101	6.0	85.4			
								Bus35	0.083	0.050	3.0	85.9			
Bus35	20.000	94.362	-0.7	0	0	0.083	0.052	Bus34	-0.083	-0.052	3.0	85.0			
Bus36	20.000	94.351	-0.7	0	0	0.042	0.026	Bus33	-0.291	-0.173	10.4	86.0			
								Bus37	0.250	0.147	8.9	86.2			
Bus37	20.000	94.279	-0.7	0	0	0.083	0.052	Bus36	-0.249	-0.149	8.9	85.9			
								Bus38	0.166	0.097	5.9	86.3			
Bus38	20.000	94.211	-0.7	0	0	0.042	0.026	Bus37	-0.166	-0.099	5.9	85.9			
								Bus39	0.125	0.075	4.4	86.2			
Bus39	20.000	94.195	-0.7	0	0	0.083	0.051	Bus38	-0.125	-0.075	4.5	85.6			
								Bus40	0.042	0.024	1.5	86.8			
Bus40	20.000	94.183	-0.7	0	0	0.042	0.026	Bus39	-0.042	-0.026	1.5	85.0			
Bus41	20.000	94.361	-0.7	0	0	0.133	0.082	Bus5	-2.908	-1.737	103.6	85.9			
								Bus42	2.735	1.654	98.8	85.9			
Bus42	20.000	93.563	-0.7	0	0	0	0	Bus41	-2.753	-1.640	98.9	85.9			

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Bus		Voltage			Generation		Load		Load Flow					XFMR	
ID	kV	%Mag	Ang	MW	Mvar	MW	Mvar	ID	MW	Mvar	Ang	%DF	%Tap		
								Bus43	0.166	0.097	5.9	86.3			
								Bus46	2.597	1.543	92.9	85.9			
Bus43	20.000	93.513	-0.7	0	0	0.041	0.026	Bus42	-0.166	-0.099	6.0	85.9			
								Bus44	0.124	0.073	4.5	86.2			
Bus44	20.000	93.479	-0.7	0	0	0.083	0.051	Bus43	-0.124	-0.075	4.5	85.6			
								Bus45	0.041	0.024	1.5	86.7			
Bus45	20.000	93.467	-0.7	0	0	0.041	0.026	Bus44	-0.041	-0.026	1.5	85.0			
Bus46	20.000	92.812	-0.8	0	0	0	0	Bus42	-2.567	-1.530	93.0	85.9			
								Bus47	0.083	0.049	3.0	85.9			
								Bus48	2.485	1.481	90.0	85.9			
Bus47	20.000	92.787	-0.8	0	0	0.083	0.051	Bus46	-0.083	-0.051	3.0	85.0			
Bus48	20.000	92.683	-0.8	0	0	0.041	0.026	Bus46	-2.466	-1.469	90.0	85.9			
								Bus49	2.425	1.444	88.5	85.9			
Bus49	20.000	91.370	-0.8	0	0	0	0	Bus48	-2.407	-1.432	88.5	85.9			
								Bus50	0.247	0.147	9.1	85.8			
								Bus53	2.161	1.285	78.4	86.0			
Bus50	20.000	91.296	-0.8	0	0	0.082	0.051	Bus49	-0.247	-0.149	9.1	85.6			
								Bus51	0.164	0.098	6.1	85.8			
Bus51	20.000	91.247	-0.9	0	0	0.082	0.051	Bus50	-0.164	-0.100	6.1	85.4			
								Bus52	0.082	0.049	3.0	85.8			
Bus52	20.000	91.223	-0.9	0	0	0.082	0.051	Bus51	-0.082	-0.051	3.1	85.0			
Bus53	20.000	90.728	-0.9	0	0	0	0	Bus49	-2.146	-1.276	78.5	86.0			
								Bus54	0.041	0.024	1.5	86.7			
								Bus55	2.105	1.252	77.9	85.9			
Bus54	20.000	90.716	-0.9	0	0	0.041	0.025	Bus53	-0.041	-0.025	1.5	85.0			
Bus55	20.000	90.098	-0.9	0	0	0.041	0.025	Bus53	-2.092	-1.244	78.0	85.9			
								Bus56	2.051	1.219	76.4	86.0			
Bus56	20.000	89.481	-1.0	0	0	0.082	0.051	Bus55	-2.038	-1.211	76.5	86.0			
								Bus57	1.956	1.160	73.4	86.0			
Bus57	20.000	88.888	-1.0	0	0	0.041	0.025	Bus56	-1.944	-1.153	73.4	86.0			
								Bus58	1.901	1.128	71.8	86.0			
Bus58	20.000	88.387	-1.0	0	0	0.041	0.025	Bus57	-1.891	-1.121	71.9	86.0			
								Bus59	1.851	1.095	70.3	86.1			
Bus59	20.000	87.739	-1.1	0	0	0	0	Bus58	-1.840	-1.089	70.3	86.1			
								Bus60	0.162	0.094	6.2	86.6			
								Bus64	1.677	0.995	64.2	86.0			
Bus60	20.000	87.689	-1.1	0	0	0.041	0.025	Bus59	-0.162	-0.095	6.2	86.2			
								Bus61	0.122	0.070	4.6	86.6			
Bus61	20.000	87.652	-1.1	0	0	0.041	0.025	Bus60	-0.122	-0.072	4.7	86.0			

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Bus		Voltage			Generation		Load		Load Flow					XFMR	
ID	kV	%Mag	Ang	MW	Mvar	MW	Mvar	ID	MW	Mvar	Ang	%DF	%Tap		
								Bus52	0.041	0.023	1.5	86.6			
								Bus53	0.041	0.023	1.5	86.6			
Bus52	20.000	87.639	-1.1	0	0	0.041	0.025	Bus61	-0.041	-0.025	1.6	85.0			
Bus53	20.000	87.639	-1.1	0	0	0.041	0.025	Bus61	-0.041	-0.025	1.6	85.0			
Bus54	20.000	87.221	-1.1	0	0	0	0	Bus59	-1.668	-0.990	64.2	86.0			
								Bus55	1.221	0.729	47.1	85.9			
								Bus64	0.447	0.261	17.1	86.4			
Bus55	20.000	86.840	-1.1	0	0	0.040	0.025	Bus64	-1.216	-0.727	47.1	85.8			
								Bus67	1.136	0.679	44.0	85.8			
								Bus66	0.040	0.023	1.6	86.5			
Bus66	20.000	86.828	-1.1	0	0	0.040	0.025	Bus65	-0.040	-0.025	1.6	85.0			
Bus67	20.000	86.483	-1.2	0	0	0.040	0.025	Bus65	-1.131	-0.677	44.0	85.8			
								Bus68	1.091	0.632	42.4	85.8			
Bus68	20.000	86.142	-1.2	0	0	0.040	0.025	Bus67	-1.087	-0.631	42.5	85.8			
								Bus71	0.026	0.014	1.1	85.8			
								Bus69	0.121	0.072	4.7	86.0			
Bus69	20.000	86.104	-1.2	0	0	0.081	0.050	Bus68	-0.121	-0.073	4.7	85.5			
								Bus70	0.040	0.023	1.6	86.5			
Bus70	20.000	86.091	-1.2	0	0	0.040	0.025	Bus69	-0.040	-0.025	1.6	85.0			
Bus71	20.000	85.850	-1.2	0	0	0	0	Bus68	-0.023	-0.013	1.1	85.8			
								Bus75	0.842	0.508	31.1	85.6			
								Bus72	0.081	0.045	3.1	87.3			
Bus72	20.000	85.825	-1.2	0	0	0	0	Bus71	-0.081	-0.047	3.1	86.5			
								Bus73	0.040	0.023	1.6	86.5			
								Bus74	0.040	0.023	1.6	86.5			
Bus73	20.000	85.812	-1.2	0	0	0.040	0.025	Bus72	-0.040	-0.025	1.6	85.0			
Bus74	20.000	85.812	-1.2	0	0	0.040	0.025	Bus72	-0.040	-0.025	1.6	85.0			
Bus75	20.000	85.582	-1.2	0	0	0.040	0.025	Bus71	-0.040	-0.025	1.1	85.6			
								Bus76	0.719	0.437	26.4	85.5			
								Bus76	0.080	0.047	3.1	86.5			
Bus76	20.000	85.557	-1.2	0	0	0.040	0.025	Bus75	-0.080	-0.048	3.2	85.8			
								Bus77	0.040	0.023	1.6	86.5			
Bus77	20.000	85.544	-1.2	0	0	0.040	0.025	Bus76	-0.040	-0.025	1.6	85.0			
Bus78	20.000	85.353	-1.2	0	0	0	0	Bus75	-0.717	-0.437	26.4	85.4			
								Bus81	0.596	0.365	23.7	85.3			
								Bus79	0.121	0.072	4.7	86.0			
Bus79	20.000	85.314	-1.2	0	0	0.040	0.025	Bus78	-0.121	-0.073	4.8	85.5			
								Bus80	0.080	0.048	3.2	85.8			
Bus80	20.000	85.288	-1.2	0	0	0.080	0.050	Bus79	-0.080	-0.050	3.2	85.0			

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Bus	Voltage			Generation		Load		Load Flow					XPMR	
	ID	LV	%Mag	Ang	MW	Mvar	MW	Mvar	ID	MW	Mvar	Ang	%W	%Tap
Bus1	20.000	85.161	-1.3	0	0	0	0	Bus78	-0.595	-0.366	23.7	85.2		
								Bus82	0.555	0.343	22.1	85.1		
								Bus83	0.040	0.025	1.6	86.5		
Bus2	20.000	84.982	-1.3	0	0	0.554	0.343	Bus81	-0.554	-0.343	22.1	85.0		
Bus3	20.000	85.148	-1.3	0	0	0.040	0.025	Bus51	-0.040	-0.025	1.6	85.0		
Bus4	20.000	87.083	-1.1	0	0	0.081	0.050	Bus64	-0.446	-0.262	17.1	86.2		
Bus5	20.000	86.970	-1.1	0	0	0.040	0.025	Bus54	-0.365	-0.213	14.0	86.4		
								Bus86	0.324	0.188	12.4	86.5		
Bus6	20.000	86.869	-1.1	0	0	0.040	0.025	Bus85	-0.324	-0.189	12.5	86.3		
								Bus87	0.283	0.164	10.9	86.5		
Bus7	20.000	86.781	-1.2	0	0	0.040	0.025	Bus86	-0.283	-0.166	10.9	86.3		
								Bus88	0.243	0.141	9.3	86.5		
Bus8	20.000	86.706	-1.2	0	0	0.040	0.025	Bus87	-0.243	-0.142	9.4	86.3		
								Bus89	0.202	0.117	7.8	86.5		
Bus9	20.000	86.643	-1.2	0	0	0.040	0.025	Bus88	-0.202	-0.119	7.8	86.2		
								Bus90	0.162	0.094	6.2	86.5		
Bus0	20.000	86.583	-1.2	0	0	0.040	0.025	Bus89	-0.162	-0.095	6.3	86.2		
								Bus91	0.121	0.070	4.7	86.5		
Bus1	20.000	86.555	-1.2	0	0	0.040	0.025	Bus90	-0.121	-0.072	4.7	86.0		
								Bus92	0.081	0.047	3.1	86.5		
Bus2	20.000	86.529	-1.2	0	0	0.040	0.025	Bus91	-0.081	-0.048	3.1	85.8		
								Bus93	0.040	0.023	1.6	86.5		
Bus3	20.000	86.517	-1.2	0	0	0.040	0.025	Bus92	-0.040	-0.025	1.6	85.0		
Bus4	20.000	95.199	-0.6	0	0	0	0	Bus5	0.000	0.000	0.0	0.0		

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)
 # Indicates a bus with a load mismatch of more than 0.1 MVA

Critical Report

Critical Alerts Report

Device ID	Type	Condition	Rating Limit	Unit	Operating	% Operating	Phase Type
Bus66	Bus	Under Voltage	20,000	kV	17,365	86.8	3-Phase
Bus67	Bus	Under Voltage	20,000	kV	17,297	86.5	3-Phase
Bus68	Bus	Under Voltage	20,000	kV	17,228	86.1	3-Phase
Bus69	Bus	Under Voltage	20,000	kV	17,220	86.1	3-Phase
Bus70	Bus	Under Voltage	20,000	kV	17,218	86.1	3-Phase
Bus71	Bus	Under Voltage	20,000	kV	17,170	85.8	3-Phase
Bus72	Bus	Under Voltage	20,000	kV	17,165	85.8	3-Phase
Bus73	Bus	Under Voltage	20,000	kV	17,162	85.8	3-Phase
Bus74	Bus	Under Voltage	20,000	kV	17,162	85.8	3-Phase
Bus75	Bus	Under Voltage	20,000	kV	17,116	85.6	3-Phase
Bus76	Bus	Under Voltage	20,000	kV	17,111	85.6	3-Phase
Bus77	Bus	Under Voltage	20,000	kV	17,108	85.5	3-Phase
Bus78	Bus	Under Voltage	20,000	kV	17,070	85.4	3-Phase
Bus79	Bus	Under Voltage	20,000	kV	17,063	85.3	3-Phase
Bus80	Bus	Under Voltage	20,000	kV	17,057	85.3	3-Phase
Bus81	Bus	Under Voltage	20,000	kV	17,032	85.2	3-Phase
Bus82	Bus	Under Voltage	20,000	kV	16,996	85.0	3-Phase
Bus83	Bus	Under Voltage	20,000	kV	17,029	85.1	3-Phase
Bus84	Bus	Under Voltage	20,000	kV	17,416	87.1	3-Phase
Bus85	Bus	Under Voltage	20,000	kV	17,394	87.0	3-Phase
Bus86	Bus	Under Voltage	20,000	kV	17,374	86.9	3-Phase
Bus87	Bus	Under Voltage	20,000	kV	17,356	86.8	3-Phase
Bus88	Bus	Under Voltage	20,000	kV	17,341	86.7	3-Phase
Bus89	Bus	Under Voltage	20,000	kV	17,328	86.6	3-Phase
Bus90	Bus	Under Voltage	20,000	kV	17,318	86.6	3-Phase
Bus91	Bus	Under Voltage	20,000	kV	17,311	86.6	3-Phase
Bus92	Bus	Under Voltage	20,000	kV	17,306	86.5	3-Phase
Bus93	Bus	Under Voltage	20,000	kV	17,303	86.5	3-Phase

Critical Alerts Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
Bus30	Bus	Under Voltage	20,000	kV	18,994	95.0	3-Phase
Bus31	Bus	Under Voltage	20,000	kV	18,953	94.8	3-Phase
Bus32	Bus	Under Voltage	20,000	kV	18,918	94.6	3-Phase
Bus33	Bus	Under Voltage	20,000	kV	18,887	94.4	3-Phase
Bus34	Bus	Under Voltage	20,000	kV	18,877	94.4	3-Phase
Bus35	Bus	Under Voltage	20,000	kV	18,872	94.4	3-Phase
Bus36	Bus	Under Voltage	20,000	kV	18,870	94.3	3-Phase
Bus37	Bus	Under Voltage	20,000	kV	18,855	94.3	3-Phase
Bus38	Bus	Under Voltage	20,000	kV	18,846	94.2	3-Phase
Bus39	Bus	Under Voltage	20,000	kV	18,839	94.2	3-Phase
Bus40	Bus	Under Voltage	20,000	kV	18,836	94.2	3-Phase
Bus41	Bus	Under Voltage	20,000	kV	18,872	94.4	3-Phase
Bus42	Bus	Under Voltage	20,000	kV	18,712	93.6	3-Phase
Bus43	Bus	Under Voltage	20,000	kV	18,703	93.5	3-Phase
Bus44	Bus	Under Voltage	20,000	kV	18,695	93.5	3-Phase
Bus45	Bus	Under Voltage	20,000	kV	18,693	93.5	3-Phase
Bus46	Bus	Under Voltage	20,000	kV	18,562	92.8	3-Phase
Bus47	Bus	Under Voltage	20,000	kV	18,557	92.8	3-Phase
Bus48	Bus	Under Voltage	20,000	kV	18,417	92.1	3-Phase
Bus49	Bus	Under Voltage	20,000	kV	18,274	91.4	3-Phase
Bus50	Bus	Under Voltage	20,000	kV	18,259	91.3	3-Phase
Bus51	Bus	Under Voltage	20,000	kV	18,249	91.2	3-Phase
Bus52	Bus	Under Voltage	20,000	kV	18,244	91.2	3-Phase
Bus53	Bus	Under Voltage	20,000	kV	18,145	90.7	3-Phase
Bus54	Bus	Under Voltage	20,000	kV	18,143	90.7	3-Phase
Bus55	Bus	Under Voltage	20,000	kV	18,019	90.1	3-Phase
Bus56	Bus	Under Voltage	20,000	kV	17,896	89.5	3-Phase
Bus57	Bus	Under Voltage	20,000	kV	17,777	88.9	3-Phase
Bus58	Bus	Under Voltage	20,000	kV	17,661	88.3	3-Phase
Bus59	Bus	Under Voltage	20,000	kV	17,548	87.7	3-Phase
Bus60	Bus	Under Voltage	20,000	kV	17,538	87.7	3-Phase
Bus61	Bus	Under Voltage	20,000	kV	17,530	87.7	3-Phase
Bus62	Bus	Under Voltage	20,000	kV	17,528	87.6	3-Phase
Bus63	Bus	Under Voltage	20,000	kV	17,528	87.6	3-Phase
Bus64	Bus	Under Voltage	20,000	kV	17,444	87.2	3-Phase
Bus65	Bus	Under Voltage	20,000	kV	17,368	86.8	3-Phase

Marginal Report

Project:
Location:
Contract:
Engineer:
Filename: LONGGINUS NACIMENTO

ETAP
12.6.0H

Study Case: LF

Page: 1
Date: 12-27-2021
SN:
Revision: Base
Config.: Normal

Alert Summary Report

<u>Loading</u>	% Alert Settings	
	<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	95.0	98.0
<u>Generator Excitation</u>		
OverExcited (Q Max.)	100.0	95.0
UnderExcited (Q Min.)	100.0	

Marginal Alerts 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>
Bus26	Bus	Under Voltage	20.000	kV	19.472	97.4	3-Phase
Bus27	Bus	Under Voltage	20.000	kV	19.467	97.3	3-Phase
Bus28	Bus	Under Voltage	20.000	kV	19.252	96.3	3-Phase
Bus29	Bus	Under Voltage	20.000	kV	19.247	96.2	3-Phase
Bus5	Bus	Under Voltage	20.000	kV	19.039	95.2	3-Phase

Marginal Alerts 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>
Bus26	Bus	Under Voltage	20.000	kV	19.472	97.4	3-Phase
Bus27	Bus	Under Voltage	20.000	kV	19.467	97.3	3-Phase
Bus28	Bus	Under Voltage	20.000	kV	19.252	96.3	3-Phase
Bus29	Bus	Under Voltage	20.000	kV	19.247	96.2	3-Phase
Bus5	Bus	Under Voltage	20.000	kV	19.039	95.2	3-Phase