

Project:
 Location:
 Contract:
 Engineer:
 Filename: hadeeldoaa

ETAP
 12.6.0H

Study Case: LF

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 Date: 05-28-2019
 SN:
 Revision: Base
 Config.: Normal

Alert Summary Report

% Alert Settings

	<u>Critical</u>	<u>Marginal</u>
<u>Loading</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>
82.	Bus	Over Voltage	0.381	kV	0.399	104.6	3-Phase

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<u>Bus Voltage</u>		
OverVoltage	105.0	102.0
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<u>Generator Excitation</u>		
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Marginal Alerts Report

Device ID	Type	Condition	Rating/Limit	Unit	Operating	% Operating	Phase Type
10	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
11	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
12	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
13	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
14	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
16	Bus	Under Voltage	0.400	kV	0.392	97.9	3-Phase
17	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
44	Bus	Under Voltage	0.400	kV	0.392	98.0	3-Phase
45	Bus	Under Voltage	0.400	kV	0.392	98.0	3-Phase
46	Bus	Under Voltage	0.400	kV	0.392	98.0	3-Phase
47	Bus	Under Voltage	0.400	kV	0.392	98.0	3-Phase
48	Bus	Under Voltage	0.400	kV	0.391	97.8	3-Phase
49	Bus	Under Voltage	0.400	kV	0.391	97.8	3-Phase
50	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
51	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
52	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
53	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
58	Bus	Under Voltage	0.400	kV	0.392	98.0	3-Phase
59	Bus	Under Voltage	0.400	kV	0.391	97.8	3-Phase
6	Bus	Under Voltage	0.400	kV	0.392	97.9	3-Phase
60	Bus	Under Voltage	0.400	kV	0.391	97.8	3-Phase
61	Bus	Under Voltage	0.400	kV	0.391	97.8	3-Phase
62	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
63	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
64	Bus	Under Voltage	0.400	kV	0.391	97.7	3-Phase
7	Bus	Under Voltage	0.400	kV	0.392	97.9	3-Phase
73	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
74	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
75	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
76	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
77	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
78	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
79	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
8	Bus	Under Voltage	0.400	kV	0.392	97.9	3-Phase
80	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
81	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase

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82.	Bus	Over Voltage	0.381	kV	0.390	102.4	3-Phase
83	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
84	Bus	Under Voltage	0.400	kV	0.390	97.6	3-Phase
85	Bus	Under Voltage	0.400	kV	0.390	97.5	3-Phase
86	Bus	Under Voltage	0.400	kV	0.390	97.5	3-Phase
87	Bus	Under Voltage	0.400	kV	0.390	97.5	3-Phase
88	Bus	Under Voltage	0.400	kV	0.390	97.5	3-Phase
89	Bus	Under Voltage	0.400	kV	0.390	97.5	3-Phase
9	Bus	Under Voltage	0.400	kV	0.391	97.9	3-Phase
90	Bus	Under Voltage	0.400	kV	0.389	97.3	3-Phase
91	Bus	Under Voltage	0.400	kV	0.389	97.3	3-Phase
92	Bus	Under Voltage	0.400	kV	0.389	97.3	3-Phase
93	Bus	Under Voltage	0.400	kV	0.389	97.3	3-Phase

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LOAD FLOW REPORT

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
0	0.400	98.563	-0.3	0	0	0	0	1	11.459	3.763	17.7	95.0	
								18	50.591	16.632	78.0	95.0	
								65	2.470	0.812	3.8	95.0	
								66	6.042	1.986	9.3	95.0	
								69	-35.838	16.753	57.9	-90.6	
								Bus2	-34.724	-39.946	77.5	65.6	
1	0.400	98.562	-0.3	0	0	0	0	0	-11.458	-3.763	17.7	95.0	
								2	11.458	3.763	17.7	95.0	
2	0.400	98.555	-0.3	0	0	1.6	0.5	1	-11.458	-3.762	17.7	95.0	
								3	9.890	3.247	15.2	95.0	
3	0.400	98.553	-0.3	0	0	1.7	0.6	2	-9.890	-3.247	15.2	95.0	
								4	8.151	2.676	12.6	95.0	
4	0.400	98.461	-0.3	0	0	0.5	0.2	3	-8.143	-2.675	12.6	95.0	
								5	7.159	2.351	11.0	95.0	
								15	0.455	0.150	0.7	95.0	
5	0.400	98.456	-0.3	0	0	0.3	0.1	4	-7.158	-2.351	11.0	95.0	
								6	6.891	2.263	10.6	95.0	
6	0.400	98.323	-0.3	0	0	0.3	0.1	5	-6.881	-2.262	10.6	95.0	
								7	6.614	2.174	10.2	95.0	
								16	0.809	0.266	1.3	95.0	
7	0.400	98.322	-0.3	0	0	1.1	0.4	6	-6.614	-2.174	10.2	95.0	
								8	4.683	1.539	7.2	95.0	
								16	0.809	0.266	1.3	95.0	
8	0.400	98.320	-0.3	0	0	0.6	0.2	7	-4.683	-1.539	7.2	95.0	
								9	4.038	1.327	6.2	95.0	
9	0.400	98.315	-0.3	0	0	0.5	0.2	8	-4.038	-1.327	6.2	95.0	
								10	3.519	1.157	5.4	95.0	
10	0.400	98.315	-0.3	0	0	0.5	0.2	9	-3.519	-1.157	5.4	95.0	
								11	3.010	0.989	4.7	95.0	
11	0.400	98.314	-0.3	0	0	0.6	0.2	10	-3.010	-0.989	4.7	95.0	
								12	2.394	0.787	3.7	95.0	
12	0.400	98.314	-0.3	0	0	0	0	11	-2.394	-0.787	3.7	95.0	
								13	0.902	0.296	1.4	95.0	
								17	1.493	0.491	2.3	95.0	
13	0.400	98.314	-0.3	0	0	0.5	0.2	12	-0.902	-0.296	1.4	95.0	
								14	0.436	0.143	0.7	95.0	
14	0.400	98.307	-0.3	0	0	0.4	0.1	13	-0.436	-0.143	0.7	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
15	0.400	98.461	-0.3	0	0	0.5	0.1	4	-0.455	-0.150	0.7	95.0	
16	0.400	98.321	-0.3	0	0	0.8	0.3	7	-0.809	-0.266	1.3	95.0	
17	0.400	98.313	-0.3	0	0	1.5	0.5	12	-1.493	-0.491	2.3	95.0	
18	0.400	98.548	-0.3	0	0	2.4	0.8	0	-50.584	-16.631	78.0	95.0	
								19	2.369	0.779	3.7	95.0	
								21.	45.817	15.064	70.6	95.0	
19	0.400	98.548	-0.3	0	0	0.5	0.2	18	-2.369	-0.779	3.7	95.0	
								20	1.842	0.605	2.8	95.0	
20	0.400	98.547	-0.3	0	0	1.8	0.6	19	-1.842	-0.605	2.8	95.0	
21.	0.400	98.537	-0.3	0	0	0.8	0.2	18	-45.811	-15.063	70.6	95.0	
								22.	45.058	14.816	69.5	95.0	
22.	0.400	98.518	-0.3	0	0	2.0	0.7	21.	-45.049	-14.814	69.5	95.0	
								23.	43.021	14.148	66.4	95.0	
23.	0.400	98.511	-0.3	0	0	1.3	0.4	22.	-43.018	-14.147	66.4	95.0	
								24.	4.917	1.616	7.6	95.0	
								28	36.758	12.090	56.7	95.0	
24.	0.400	98.510	-0.3	0	0	0.8	0.3	23.	-4.917	-1.616	7.6	95.0	
								25.	4.092	1.345	6.3	95.0	
25.	0.400	98.508	-0.3	0	0	2.4	0.8	24.	-4.092	-1.345	6.3	95.0	
								27	0.494	0.162	0.8	95.0	
								26.	1.178	0.387	1.8	95.0	
26.	0.400	98.507	-0.3	0	0	1.2	0.4	25.	-1.178	-0.387	1.8	95.0	
27	0.400	98.508	-0.3	0	0	0.5	0.2	25.	-0.494	-0.162	0.8	95.0	
28	0.400	98.502	-0.3	0	0	1.4	0.5	23.	-36.754	-12.089	56.7	95.0	
								29	35.340	11.625	54.5	95.0	
29	0.400	98.490	-0.3	0	0	1.9	0.6	28	-35.336	-11.624	54.5	95.0	
								30	33.420	10.994	51.6	95.0	
30	0.400	98.484	-0.3	0	0	1.9	0.6	29	-33.418	-10.994	51.6	95.0	
								31	4.177	1.373	6.4	95.0	
								37	7.874	2.588	12.1	95.0	
								40	19.450	6.403	30.0	95.0	
31	0.400	98.482	-0.3	0	0	1.2	0.4	30	-4.177	-1.373	6.4	95.0	
								32	2.993	0.984	4.6	95.0	
32	0.400	98.479	-0.3	0	0	0.5	0.2	31	-2.993	-0.984	4.6	95.0	
								33	2.465	0.810	3.8	95.0	
33	0.400	98.477	-0.3	0	0	1.0	0.3	32	-2.465	-0.810	3.8	95.0	
								34	1.453	0.477	2.2	95.0	
34	0.400	98.477	-0.3	0	0	0.2	0.1	33	-1.453	-0.477	2.2	95.0	
								35	1.217	0.400	1.9	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
35	0.400	98.475	-0.3	0	0	1.1	0.4	34	-1.217	-0.400	1.9	95.0	
								36	0.118	0.039	0.2	95.0	
36	0.400	98.475	-0.3	0	0	0.1	0.0	35	-0.118	-0.039	0.2	95.0	
37	0.400	98.481	-0.3	0	0	2.6	0.9	30	-7.874	-2.588	12.1	95.0	
								38	5.225	1.717	8.1	95.0	
38	0.400	98.479	-0.3	0	0	2.6	0.8	37	-5.225	-1.717	8.1	95.0	
								39	2.649	0.871	4.1	95.0	
39	0.400	98.478	-0.3	0	0	2.6	0.9	38	-2.649	-0.871	4.1	95.0	
40	0.400	98.475	-0.3	0	0	0.1	0.0	30	-19.448	-6.403	30.0	95.0	
								41	19.316	6.359	29.8	95.0	
41	0.400	98.469	-0.3	0	0	0.7	0.2	40	-19.315	-6.359	29.8	95.0	
								42	18.612	6.128	28.7	95.0	
42	0.400	98.462	-0.3	0	0	0	0	41	-18.611	-6.128	28.7	95.0	
								43	17.887	5.890	27.6	95.0	
								54	0.724	0.238	1.1	95.0	
43	0.400	98.448	-0.3	0	0	1.5	0.5	42	-17.884	-5.890	27.6	95.0	
								44	15.414	5.078	23.8	95.0	
								55	0.994	0.327	1.5	95.0	
44	0.400	98.442	-0.3	0	0	1.3	0.4	43	-15.413	-5.078	23.8	95.0	
								45	14.079	4.639	21.7	95.0	
45	0.400	98.440	-0.3	0	0	0	0	44	-14.079	-4.639	21.7	95.0	
								46	12.875	4.244	19.9	95.0	
								58	1.204	0.396	1.9	95.0	
46	0.400	98.438	-0.3	0	0	2.8	0.9	45	-12.875	-4.244	19.9	95.0	
								47	10.110	3.335	15.6	95.0	
47	0.400	98.426	-0.3	0	0	0.5	0.2	46	-10.108	-3.334	15.6	95.0	
								48	9.597	3.167	14.8	95.0	
48	0.400	98.251	-0.4	0	0	0	0	47	-9.584	-3.148	14.8	95.0	
								49	7.326	2.406	11.3	95.0	
								59	2.258	0.742	3.5	95.0	
49	0.400	98.248	-0.4	0	0	1.3	0.4	48	-7.326	-2.406	11.3	95.0	
								50	6.006	1.972	9.3	95.0	
50	0.400	98.140	-0.4	0	0	0.0	0.0	49	-5.999	-1.972	9.3	95.0	
								51	4.207	1.383	6.5	95.0	
								62	1.752	0.576	2.7	95.0	
51	0.400	98.139	-0.4	0	0	0	0	50	-4.207	-1.383	6.5	95.0	
								52	2.062	0.678	3.2	95.0	
								63	2.144	0.705	3.3	95.0	
52	0.400	98.139	-0.4	0	0	0.2	0.1	51	-2.062	-0.678	3.2	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
								53	1.827	0.600	2.8	95.0	
53	0.400	98.138	-0.4	0	0	1.8	0.6	52	-1.827	-0.600	2.8	95.0	
54	0.400	98.461	-0.3	0	0	0.7	0.2	42	-0.724	-0.238	1.1	95.0	
55	0.400	98.448	-0.3	0	0	1.0	0.3	43	-0.994	-0.327	1.5	95.0	
								56	0.040	0.013	0.1	95.0	
56	0.400	98.448	-0.3	0	0	0.0	0.0	55	-0.040	-0.013	0.1	95.0	
58	0.400	98.440	-0.3	0	0	1.2	0.4	45	-1.204	-0.396	1.9	95.0	
59	0.400	98.246	-0.4	0	0	0.8	0.3	48	-2.258	-0.742	3.5	95.0	
								60	1.489	0.489	2.3	95.0	
60	0.400	98.244	-0.4	0	0	0.9	0.3	59	-1.489	-0.489	2.3	95.0	
								61	0.565	0.186	0.9	95.0	
61	0.400	98.243	-0.4	0	0	0.6	0.2	60	-0.565	-0.186	0.9	95.0	
62	0.400	98.139	-0.4	0	0	1.8	0.6	50	-1.752	-0.576	2.7	95.0	
63	0.400	98.138	-0.4	0	0	1.7	0.5	51	-2.144	-0.705	3.3	95.0	
								64	0.471	0.155	0.7	95.0	
64	0.400	98.138	-0.4	0	0	0.5	0.2	63	-0.471	-0.155	0.7	95.0	
65	0.400	98.563	-0.3	0	0	2.5	0.8	0	-2.470	-0.812	3.8	95.0	
66	0.400	98.561	-0.3	0	0	3.9	1.3	0	-6.042	-1.986	9.3	95.0	
								67	2.113	0.695	3.3	95.0	
67	0.400	98.561	-0.3	0	0	1.7	0.6	66	-2.113	-0.695	3.3	95.0	
								68	0.420	0.138	0.6	95.0	
68	0.400	98.560	-0.3	0	0	0.4	0.1	67	-0.420	-0.138	0.6	95.0	
69	0.400	98.576	-0.3	0	0	0	0	0	35.844	-16.752	57.9	-90.6	
								70	-42.815	14.461	66.2	-94.7	
								94	6.971	2.291	10.7	95.0	
70	0.400	98.588	-0.3	0	0	0.8	0.3	69	42.821	-14.460	66.2	-94.7	
								71	-43.643	14.190	67.2	-95.1	
71	0.400	98.595	-0.3	0	0	0.9	0.3	70	43.647	-14.190	67.2	-95.1	
								72.	-44.570	13.886	68.3	-95.5	
72.	0.400	98.619	-0.3	0	0	0.4	0.1	71	44.583	-13.885	68.3	-95.5	
								73.	-44.979	13.755	68.8	-95.6	
73.	0.400	99.575	-0.1	0	0	0	0	72.	45.477	-13.682	68.8	-95.8	
								74	1.454	0.478	2.2	95.0	
								77	-46.931	13.204	70.7	-96.3	
74	0.400	99.575	-0.1	0	0	0	0	73.	-1.454	-0.478	2.2	95.0	
								75	0.672	0.221	1.0	95.0	
								76	0.783	0.257	1.2	95.0	
75	0.400	99.574	-0.1	0	0	0.7	0.2	74	-0.672	-0.221	1.0	95.0	
76	0.400	99.574	-0.1	0	0	0.8	0.3	74	-0.783	-0.257	1.2	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
77	0.400	99.628	-0.1	0	0	0.9	0.3	73.	46.960	-13.200	70.7	-96.3	
								78	7.577	2.490	11.6	95.0	
								81	-55.429	10.416	81.7	-98.3	
78	0.400	99.627	-0.1	0	0	5.1	1.7	77	-7.577	-2.490	11.6	95.0	
								79	2.524	0.829	3.8	95.0	
79	0.400	99.626	-0.1	0	0	1.5	0.5	78	-2.524	-0.829	3.8	95.0	
								80	1.036	0.341	1.6	95.0	
80	0.400	99.617	-0.1	0	0	1.0	0.3	79	-1.036	-0.341	1.6	95.0	
81	0.400	99.638	-0.1	0	0	0	0	77	55.435	-10.415	81.7	-98.3	
								82.	1.202	0.395	1.8	95.0	
								83	-56.637	10.020	83.3	-98.5	
82.	0.381	104.592	-0.1	0	0	1.2	0.4	81	-1.202	-0.395	1.8	95.0	
83	0.400	99.649	-0.1	0	0	0.7	0.2	81	56.644	-10.019	83.3	-98.5	
								84	-57.383	9.777	84.3	-98.6	
84	0.400	99.746	0.0	0	0	1.6	0.5	83	57.440	-9.776	84.3	-98.6	
								85	-59.021	9.256	86.5	-98.8	
85	0.400	99.767	0.0	0	0	0	0	84	59.034	-9.254	86.5	-98.8	
								86	0.694	0.228	1.1	95.0	
								87	-59.728	9.026	87.4	-98.9	
86	0.400	99.766	0.0	0	0	0.7	0.2	85	-0.694	-0.228	1.1	95.0	
87	0.400	99.964	0.0	0	0	0	0	85	59.852	-9.008	87.4	-98.9	
								89	-60.950	8.647	88.9	-99.0	
								88	1.099	0.361	1.7	95.0	
88	0.400	99.962	0.0	0	0	1.1	0.4	87	-1.099	-0.361	1.7	95.0	
* 89	0.400	100.000	0.0	66.5	-6.8	1.6	0.5	87	60.973	-8.644	88.9	-99.0	
								90	3.906	1.282	5.9	95.0	
90	0.400	99.762	0.0	0	0	0.7	0.2	89	-3.896	-1.281	5.9	95.0	
								91	3.161	1.039	4.8	95.0	
91	0.400	99.761	0.0	0	0	1.9	0.6	90	-3.161	-1.039	4.8	95.0	
								92	1.242	0.408	1.9	95.0	
92	0.400	99.756	0.0	0	0	0.6	0.2	91	-1.242	-0.408	1.9	95.0	
								93	0.672	0.221	1.0	95.0	
93	0.400	99.754	0.0	0	0	0.7	0.2	92	-0.672	-0.221	1.0	95.0	
94	0.400	98.574	-0.3	0	0	0	0	69	-6.971	-2.291	10.7	95.0	
								95	3.750	1.233	5.8	95.0	
								96	3.221	1.058	5.0	95.0	
95	0.400	98.573	-0.3	0	0	3.8	1.2	94	-3.750	-1.233	5.8	95.0	
96	0.400	98.573	-0.3	0	0	0.4	0.1	94	-3.221	-1.058	5.0	95.0	
								97	2.849	0.936	4.4	95.0	

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Bus		Voltage			Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap	
97	0.400	98.567	-0.3	0	0	0.5	0.2	96	-2.849	-0.936	4.4	95.0		
								98	2.353	0.773	3.6	95.0		
98	0.400	98.561	-0.3	0	0	0.8	0.3	97	-2.353	-0.773	3.6	95.0		
								99	1.520	0.499	2.3	95.0		
99	0.400	98.561	-0.3	0	0	0.1	0.0	98	-1.520	-0.499	2.3	95.0		
								100	1.381	0.454	2.1	95.0		
100	0.400	98.526	-0.3	0	0	1.4	0.5	99	-1.380	-0.454	2.1	95.0		
* Bus1	33.000	100.000	0.0	35.0	38.9	0	0	Bus2	34.983	38.928	0.9	66.8		
Bus2	33.000	99.998	0.0	0	0	0	0	Bus1	-34.982	-40.742	0.9	65.1		
								0	34.982	40.742	0.9	65.1		

* 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

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LOAD FLOW REPORT

Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
0	0.400	98.120	-1.4	0	0	0	0	1	11.457	3.762	17.7	95.0	
								18	50.590	16.631	78.3	95.0	
								65	2.470	0.812	3.8	95.0	
								66	6.042	1.986	9.4	95.0	
								69	29.966	9.823	46.4	95.0	
								Bus2	-100.524	-33.013	155.6	95.0	
1	0.400	98.118	-1.4	0	0	0	0	0	-11.457	-3.762	17.7	95.0	
								2	11.457	3.762	17.7	95.0	
2	0.400	98.112	-1.4	0	0	1.6	0.5	1	-11.456	-3.762	17.7	95.0	
								3	9.888	3.247	15.3	95.0	
3	0.400	98.109	-1.4	0	0	1.7	0.6	2	-9.888	-3.247	15.3	95.0	
								4	8.150	2.675	12.6	95.0	
4	0.400	98.017	-1.4	0	0	0.5	0.2	3	-8.142	-2.674	12.6	95.0	
								5	7.159	2.351	11.1	95.0	
								15	0.454	0.149	0.7	95.0	
5	0.400	98.012	-1.4	0	0	0.3	0.1	4	-7.158	-2.351	11.1	95.0	
								6	6.891	2.263	10.7	95.0	
6	0.400	97.879	-1.4	0	0	0.3	0.1	5	-6.881	-2.262	10.7	95.0	
								7	6.614	2.174	10.3	95.0	
7	0.400	97.877	-1.4	0	0	1.1	0.4	6	-6.614	-2.174	10.3	95.0	
								8	4.683	1.539	7.3	95.0	
								16	0.809	0.266	1.3	95.0	
8	0.400	97.876	-1.4	0	0	0.6	0.2	7	-4.683	-1.539	7.3	95.0	
								9	4.038	1.327	6.3	95.0	
9	0.400	97.871	-1.4	0	0	0.5	0.2	8	-4.037	-1.327	6.3	95.0	
								10	3.519	1.157	5.5	95.0	
10	0.400	97.870	-1.4	0	0	0.5	0.2	9	-3.519	-1.157	5.5	95.0	
								11	3.010	0.989	4.7	95.0	
11	0.400	97.870	-1.4	0	0	0.6	0.2	10	-3.010	-0.989	4.7	95.0	
								12	2.394	0.787	3.7	95.0	
12	0.400	97.869	-1.4	0	0	0	0	11	-2.394	-0.787	3.7	95.0	
								13	0.902	0.296	1.4	95.0	
								17	1.493	0.491	2.3	95.0	
13	0.400	97.869	-1.4	0	0	0.5	0.2	12	-0.902	-0.296	1.4	95.0	
								14	0.436	0.143	0.7	95.0	
14	0.400	97.863	-1.4	0	0	0.4	0.1	13	-0.436	-0.143	0.7	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
15	0.400	98.017	-1.4	0	0	0.5	0.1	4	-0.454	-0.149	0.7	95.0	
16	0.400	97.877	-1.4	0	0	0.8	0.3	7	-0.809	-0.266	1.3	95.0	
17	0.400	97.869	-1.4	0	0	1.5	0.5	12	-1.493	-0.491	2.3	95.0	
18	0.400	98.105	-1.4	0	0	2.4	0.8	0	-50.582	-16.630	78.3	95.0	
								19	2.367	0.778	3.7	95.0	
								21.	45.817	15.064	71.0	95.0	
19	0.400	98.105	-1.4	0	0	0.5	0.2	18	-2.367	-0.778	3.7	95.0	
								20	1.840	0.605	2.8	95.0	
20	0.400	98.104	-1.4	0	0	1.8	0.6	19	-1.840	-0.605	2.8	95.0	
21.	0.400	98.093	-1.4	0	0	0.8	0.2	18	-45.811	-15.063	71.0	95.0	
								22.	45.058	14.816	69.8	95.0	
22.	0.400	98.074	-1.4	0	0	2.0	0.7	21.	-45.049	-14.814	69.8	95.0	
								23.	43.021	14.148	66.7	95.0	
23.	0.400	98.068	-1.4	0	0	1.3	0.4	22.	-43.018	-14.147	66.7	95.0	
								24.	4.917	1.616	7.6	95.0	
								28	36.758	12.090	57.0	95.0	
24.	0.400	98.066	-1.4	0	0	0.8	0.3	23.	-4.917	-1.616	7.6	95.0	
								25.	4.092	1.345	6.3	95.0	
25.	0.400	98.065	-1.4	0	0	2.4	0.8	24.	-4.092	-1.345	6.3	95.0	
								27	0.494	0.162	0.8	95.0	
								26.	1.178	0.387	1.8	95.0	
26.	0.400	98.063	-1.4	0	0	1.2	0.4	25.	-1.178	-0.387	1.8	95.0	
27	0.400	98.065	-1.4	0	0	0.5	0.2	25.	-0.494	-0.162	0.8	95.0	
28	0.400	98.058	-1.4	0	0	1.4	0.5	23.	-36.754	-12.089	57.0	95.0	
								29	35.340	11.624	54.8	95.0	
29	0.400	98.047	-1.4	0	0	1.9	0.6	28	-35.336	-11.624	54.8	95.0	
								30	33.420	10.994	51.8	95.0	
30	0.400	98.040	-1.4	0	0	1.9	0.6	29	-33.418	-10.994	51.8	95.0	
								31	4.177	1.373	6.5	95.0	
								37	7.874	2.588	12.2	95.0	
								40	19.450	6.403	30.1	95.0	
31	0.400	98.038	-1.4	0	0	1.2	0.4	30	-4.177	-1.373	6.5	95.0	
								32	2.993	0.984	4.6	95.0	
32	0.400	98.036	-1.4	0	0	0.5	0.2	31	-2.993	-0.984	4.6	95.0	
								33	2.465	0.810	3.8	95.0	
33	0.400	98.034	-1.4	0	0	1.0	0.3	32	-2.465	-0.810	3.8	95.0	
								34	1.453	0.477	2.3	95.0	
34	0.400	98.033	-1.4	0	0	0.2	0.1	33	-1.453	-0.477	2.3	95.0	
								35	1.217	0.400	1.9	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
35	0.400	98.032	-1.4	0	0	1.1	0.4	34	-1.217	-0.400	1.9	95.0	
								36	0.118	0.039	0.2	95.0	
36	0.400	98.032	-1.4	0	0	0.1	0.0	35	-0.118	-0.039	0.2	95.0	
37	0.400	98.037	-1.4	0	0	2.6	0.9	30	-7.874	-2.588	12.2	95.0	
								38	5.225	1.717	8.1	95.0	
38	0.400	98.035	-1.4	0	0	2.6	0.8	37	-5.225	-1.717	8.1	95.0	
								39	2.649	0.871	4.1	95.0	
39	0.400	98.034	-1.4	0	0	2.6	0.9	38	-2.649	-0.871	4.1	95.0	
40	0.400	98.032	-1.4	0	0	0.1	0.0	30	-19.448	-6.403	30.1	95.0	
								41	19.316	6.359	29.9	95.0	
41	0.400	98.025	-1.4	0	0	0.7	0.2	40	-19.315	-6.359	29.9	95.0	
								42	18.612	6.128	28.9	95.0	
42	0.400	98.018	-1.4	0	0	0	0	41	-18.611	-6.128	28.9	95.0	
								43	17.887	5.890	27.7	95.0	
								54	0.724	0.238	1.1	95.0	
43	0.400	98.005	-1.4	0	0	1.5	0.5	42	-17.884	-5.890	27.7	95.0	
								44	15.414	5.078	23.9	95.0	
								55	0.994	0.327	1.5	95.0	
44	0.400	97.998	-1.4	0	0	1.3	0.4	43	-15.413	-5.078	23.9	95.0	
								45	14.079	4.639	21.8	95.0	
45	0.400	97.997	-1.4	0	0	0	0	44	-14.079	-4.639	21.8	95.0	
								46	12.875	4.244	20.0	95.0	
								58	1.204	0.396	1.9	95.0	
46	0.400	97.994	-1.4	0	0	2.8	0.9	45	-12.875	-4.244	20.0	95.0	
								47	10.110	3.335	15.7	95.0	
47	0.400	97.982	-1.4	0	0	0.5	0.2	46	-10.108	-3.334	15.7	95.0	
								48	9.597	3.167	14.9	95.0	
48	0.400	97.807	-1.5	0	0	0	0	47	-9.584	-3.148	14.9	95.0	
								49	7.326	2.406	11.4	95.0	
								59	2.258	0.742	3.5	95.0	
49	0.400	97.803	-1.5	0	0	1.3	0.4	48	-7.326	-2.406	11.4	95.0	
								50	6.006	1.972	9.3	95.0	
50	0.400	97.695	-1.5	0	0	0.0	0.0	49	-5.999	-1.972	9.3	95.0	
								51	4.207	1.383	6.5	95.0	
								62	1.752	0.576	2.7	95.0	
51	0.400	97.694	-1.5	0	0	0	0	50	-4.207	-1.383	6.5	95.0	
								52	2.062	0.678	3.2	95.0	
								63	2.144	0.705	3.3	95.0	
52	0.400	97.693	-1.5	0	0	0.2	0.1	51	-2.062	-0.678	3.2	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
								53	1.827	0.600	2.8	95.0	
53	0.400	97.693	-1.5	0	0	1.8	0.6	52	-1.827	-0.600	2.8	95.0	
54	0.400	98.017	-1.4	0	0	0.7	0.2	42	-0.724	-0.238	1.1	95.0	
55	0.400	98.004	-1.4	0	0	1.0	0.3	43	-0.994	-0.327	1.5	95.0	
								56	0.040	0.013	0.1	95.0	
56	0.400	98.004	-1.4	0	0	0.0	0.0	55	-0.040	-0.013	0.1	95.0	
58	0.400	97.996	-1.4	0	0	1.2	0.4	45	-1.204	-0.396	1.9	95.0	
59	0.400	97.801	-1.5	0	0	0.8	0.3	48	-2.258	-0.742	3.5	95.0	
								60	1.489	0.489	2.3	95.0	
60	0.400	97.799	-1.5	0	0	0.9	0.3	59	-1.489	-0.489	2.3	95.0	
								61	0.565	0.186	0.9	95.0	
61	0.400	97.799	-1.5	0	0	0.6	0.2	60	-0.565	-0.186	0.9	95.0	
62	0.400	97.694	-1.5	0	0	1.8	0.6	50	-1.752	-0.576	2.7	95.0	
63	0.400	97.693	-1.5	0	0	1.7	0.5	51	-2.144	-0.705	3.3	95.0	
								64	0.471	0.155	0.7	95.0	
64	0.400	97.693	-1.5	0	0	0.5	0.2	63	-0.471	-0.155	0.7	95.0	
65	0.400	98.119	-1.4	0	0	2.5	0.8	0	-2.470	-0.812	3.8	95.0	
66	0.400	98.118	-1.4	0	0	3.9	1.3	0	-6.042	-1.986	9.4	95.0	
								67	2.113	0.695	3.3	95.0	
67	0.400	98.117	-1.4	0	0	1.7	0.6	66	-2.113	-0.695	3.3	95.0	
								68	0.420	0.138	0.7	95.0	
68	0.400	98.117	-1.4	0	0	0.4	0.1	67	-0.420	-0.138	0.7	95.0	
69	0.400	98.107	-1.4	0	0	0	0	0	-29.962	-9.823	46.4	95.0	
								70	22.991	7.532	35.6	95.0	
								94	6.971	2.291	10.8	95.0	
70	0.400	98.100	-1.4	0	0	0.8	0.3	69	-22.989	-7.531	35.6	95.0	
								71	22.168	7.261	34.3	95.0	
71	0.400	98.096	-1.4	0	0	0.9	0.3	70	-22.167	-7.261	34.3	95.0	
								72.	21.243	6.958	32.9	95.0	
72.	0.400	98.083	-1.4	0	0	0.4	0.1	71	-21.241	-6.957	32.9	95.0	
								73.	20.844	6.827	32.3	95.0	
73.	0.400	97.596	-1.4	0	0	0.0	0.0	72.	-20.735	-6.811	32.3	95.0	
								74	1.454	0.478	2.3	95.0	
								77	19.282	6.333	30.0	95.0	
74	0.400	97.596	-1.4	0	0	0	0	73.	-1.454	-0.478	2.3	95.0	
								75	0.672	0.221	1.0	95.0	
								76	0.783	0.257	1.2	95.0	
75	0.400	97.595	-1.4	0	0	0.7	0.2	74	-0.672	-0.221	1.0	95.0	
76	0.400	97.595	-1.4	0	0	0.8	0.3	74	-0.783	-0.257	1.2	95.0	

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Bus		Voltage		Generation		Load		Load Flow				XFMR	
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap
77	0.400	97.571	-1.4	0	0	0.9	0.3	73.	-19.277	-6.332	30.0	95.0	
								78	7.577	2.490	11.8	95.0	
								81	10.806	3.549	16.8	95.0	
78	0.400	97.570	-1.4	0	0	5.1	1.7	77	-7.577	-2.490	11.8	95.0	
								79	2.524	0.829	3.9	95.0	
79	0.400	97.569	-1.4	0	0	1.5	0.5	78	-2.524	-0.829	3.9	95.0	
								80	1.036	0.341	1.6	95.0	
80	0.400	97.560	-1.4	0	0	1.0	0.3	79	-1.036	-0.341	1.6	95.0	
81	0.400	97.569	-1.4	0	0	0	0	77	-10.806	-3.549	16.8	95.0	
								82.	1.202	0.395	1.9	95.0	
								83	9.604	3.154	15.0	95.0	
82.	0.381	102.420	-1.4	0	0	1.2	0.4	81	-1.202	-0.395	1.9	95.0	
83	0.400	97.567	-1.4	0	0	0.7	0.2	81	-9.603	-3.153	15.0	95.0	
								84	8.865	2.911	13.8	95.0	
84	0.400	97.551	-1.4	0	0	1.6	0.5	83	-8.863	-2.911	13.8	95.0	
								85	7.282	2.391	11.3	95.0	
85	0.400	97.549	-1.4	0	0	0	0	84	-7.282	-2.391	11.3	95.0	
								86	0.694	0.228	1.1	95.0	
								87	6.588	2.163	10.3	95.0	
86	0.400	97.548	-1.4	0	0	0.7	0.2	85	-0.694	-0.228	1.1	95.0	
87	0.400	97.525	-1.4	0	0	0	0	85	-6.586	-2.163	10.3	95.0	
								89	5.487	1.802	8.5	95.0	
								88	1.099	0.361	1.7	95.0	
88	0.400	97.523	-1.4	0	0	1.1	0.4	87	-1.099	-0.361	1.7	95.0	
89	0.400	97.521	-1.4	0	0	1.6	0.5	87	-5.487	-1.802	8.5	95.0	
								90	3.906	1.282	6.1	95.0	
90	0.400	97.278	-1.4	0	0	0.7	0.2	89	-3.896	-1.280	6.1	95.0	
								91	3.161	1.039	4.9	95.0	
91	0.400	97.276	-1.4	0	0	1.9	0.6	90	-3.161	-1.039	4.9	95.0	
								92	1.242	0.408	1.9	95.0	
92	0.400	97.271	-1.4	0	0	0.6	0.2	91	-1.242	-0.408	1.9	95.0	
								93	0.672	0.221	1.0	95.0	
93	0.400	97.269	-1.4	0	0	0.7	0.2	92	-0.672	-0.221	1.0	95.0	
94	0.400	98.105	-1.4	0	0	0	0	69	-6.971	-2.291	10.8	95.0	
								95	3.750	1.233	5.8	95.0	
								96	3.221	1.058	5.0	95.0	
95	0.400	98.103	-1.4	0	0	3.8	1.2	94	-3.750	-1.233	5.8	95.0	
96	0.400	98.104	-1.4	0	0	0.4	0.1	94	-3.221	-1.058	5.0	95.0	
								97	2.849	0.936	4.4	95.0	

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Bus		Voltage			Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	kW	kvar	kW	kvar	ID	kW	kvar	Amp	%PF	%Tap	
97	0.400	98.097	-1.4	0	0	0.5	0.2	96	-2.849	-0.936	4.4	95.0		
								98	2.353	0.773	3.6	95.0		
98	0.400	98.092	-1.4	0	0	0.8	0.3	97	-2.353	-0.773	3.6	95.0		
								99	1.520	0.499	2.4	95.0		
99	0.400	98.091	-1.4	0	0	0.1	0.0	98	-1.520	-0.499	2.4	95.0		
								100	1.381	0.454	2.1	95.0		
100	0.400	98.056	-1.4	0	0	1.4	0.5	99	-1.380	-0.454	2.1	95.0		
* Bus1	33.000	100.000	0.0	101.6	34.4	0	0	Bus2	101.569	34.409	1.9	94.7		
Bus2	33.000	99.995	0.0	0	0	0.0	0.0	Bus1	-101.564	-36.221	1.9	94.2		
								0	101.563	36.222	1.9	94.2		

* 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

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SHORT-CIRCUIT REPORT

3-phase fault at bus: **89**

Prefault voltage = 0.400

= 100.00 % of nominal bus kV (0.400 kV)

= 100.00 % of base (0.400 kV)

Contribution		1/2 Cycle				
From Bus ID	To Bus ID	% V From Bus	kA Real	kA Imaginary	Imag. /Real	kA Symm. Magnitude
89	Total	0.00	2.780	-2.115	0.8	3.493
87	89	1.38	2.682	-2.000	0.7	3.346
90	89	3.53	0.037	-0.080	2.2	0.088
L89	89	181.82	0.014	-0.034	2.4	0.037
Inv15	89	100.00	0.047	0.000	0.0	0.047

NACD Ratio = 1.00

Indicates a fault current contribution from a three-winding transformer

* Indicates a fault current through a tie circuit breaker

If faulted bus is involved in loops formed by protection devices, the short-circuit contributions through these PDs will not be reported.

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SHORT-CIRCUIT REPORT

3-phase fault at bus: **89**

Prefault voltage = 0.400

= 100.00 % of nominal bus kV (0.400 kV)

= 100.00 % of base (0.400 kV)

Contribution		1/2 Cycle				
From Bus ID	To Bus ID	% V From Bus	kA Real	kA Imaginary	Imag. /Real	kA Symm. Magnitude
89	Total	0.00	2.733	-2.115	0.8	3.456
87	89	1.38	2.682	-2.000	0.7	3.346
90	89	3.53	0.037	-0.080	2.2	0.088
L89	89	181.82	0.014	-0.034	2.4	0.037

NACD Ratio = 1.00

Indicates a fault current contribution from a three-winding transformer

* Indicates a fault current through a tie circuit breaker

If faulted bus is involved in loops formed by protection devices, the short-circuit contributions through these PDs will not be reported.