

Project: SHORT CIRCUIT STUDY

ETAP

2-Winding Transformer Input Data

Transformer		Rating				Z Variation			% Tap Setting		Adjusted	Phase Shift	
ID	MVA	Prim. kV	Sec. kV	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
AT-1	2.000	13.800	0.480	5.67	7.10	0	0	0	-2.500	0	5.6700	Std Pos. Seq.	-30.0
AT-2	2.000	20.800	0.480	5.44	7.10	0	0	0	-2.500	0	5.4400	Std Pos. Seq.	-30.0
TR-R	15.000	20.800	13.800	6.50	18.60	0	0	0	0	0	6.5000	Std Pos. Seq.	-30.0
XFMR-DP-1	0.075	0.480	0.480	3.70	1.92	0	0	0	0	0	3.7000	Std Pos. Seq.	-30.0
XFMR-DP-3	0.075	0.480	0.208	5.40	1.92	0	0	0	0	0	5.4000	Std Pos. Seq.	-30.0
XFMR-DP-7	0.075	0.480	0.208	5.40	1.92	0	0	0	0	0	5.4000	Std Pos. Seq.	-30.0

2-Winding Transformer Grounding Input Data

Transformer		Rating			Grounding							
ID	MVA	Prim. kV	Sec. kV	Conn.	Primary				Secondary			
				Type	Type	kV	Amp	Ohm	Type	kV	Amp	Ohm
AT-1	2.000	13.800	0.480	D/Y					XFMR-Resistor	kV1: 0.277	3.0	92.37604
AT-2	2.000	20.800	0.480	D/Y					XFMR-Resistor	kV1: 0.277	3.0	92.37604
TR-R	15.000	20.800	13.800	Y/D	Solid							
XFMR-DP-1	0.075	0.480	0.480	D/Y					Solid			
XFMR-DP-3	0.075	0.480	0.208	D/Y					Solid			
XFMR-DP-7	0.075	0.480	0.208	D/Y					Solid			

Branch Connections

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
AT-1	2W XFMR	Bus388	AT-1.	37.60	266.87	269.50	
AT-2	2W XFMR	Bus30	AT-2.	36.07	256.04	258.57	
TR-R	2W XFMR	Bus2	Bus3	2.33	43.27	43.33	
XFMR-DP-1	2W XFMR	Bus28-1	Bus22-1	2166.36	4159.41	4689.75	
XFMR-DP-3	2W XFMR	Bus32	Bus31-1	3161.71	6070.48	6844.50	
XFMR-DP-7	2W XFMR	Bus33-1	Bus34-1	3161.71	6070.48	6844.50	
PC-001	Cable	Bus1	Bus4	0.20	0.38	0.43	
PC-002	Cable	MVSG-001	Bus2	0.08	0.20	0.21	
PC-005	Cable	Bus3	MVSG-002	0.11	0.21	0.24	
PC-006	Cable	MVSG-002	Bus388	0.53	0.14	0.55	
PC-007	Cable	MVSG-001	Bus30	0.20	0.13	0.24	
PC-008	Cable	MVSG-002	Bus386	0.47	0.57	0.74	
PC-010	Cable	MVSG-002	Bus9	0.30	0.35	0.46	
PC-012	Cable	LVSG-001-BO1	MCC-001	17.53	17.51	24.78	
PC-013	Cable	LVSG-001-BO1	MCC-003	23.38	23.35	33.04	
PC-014	Cable	LVSG-001-BO2	Bus5	123.82	169.96	210.28	
PC-016	Cable	LVSG-001-BO1	VFD-P-01A	375.99	90.31	386.68	
PC-017	Cable	VFD-P-01A	Bus53	52.22	12.54	53.71	
PC-018	Cable	LVSG-001-BO1	VFD-FN-04	217.93	64.37	227.24	
PC-019	Cable	VFD-FN-04	Bus49	62.87	18.57	65.55	
PC-020	Cable	LVSG-001-BO1	VFD-P-01C	396.88	95.33	408.17	
PC-021	Cable	VFD-P-01C	Bus52	52.22	12.54	53.71	
PC-022	Cable	LVSG-001-BO2	VFD-FN-05	268.23	79.22	279.68	
PC-023	Cable	VFD-FN-05	Bus56	62.87	18.57	65.55	
PC-024	Cable	LVSG-001-BO2	MCC-002	24.54	24.52	34.69	
PC-025	Cable	LVSG-001-BO2	VFD-C-01	149.60	149.46	211.47	
PC-026	Cable	LVSG-001-BO2	VFD-CTG-M01	439.50	193.52	480.23	
PC-027	Cable	VFD-CTG-M01	Bus62	40.20	17.70	43.92	
PC-028	Cable	LVSG-001-BO2	VFD-P-01B	365.55	87.80	375.94	
PC-029	Cable	VFD-P-01B	Bus61	52.22	12.54	53.71	
PC-030	Cable	LVSG-001-BO1	VFD-P-32	804.68	237.66	839.04	
PC-031	Cable	VFD-P-32	Bus54	184.41	54.46	192.28	
PC-032	Cable	MCC-001	VFD-P-15A.	8035.95	208.41	8038.65	
PC-033	Cable	VFD-P-15A.	Bus29-1	521.81	13.53	521.99	
PC-034	Cable	MCC-001	HTR-02	9881.58	216.37	9883.95	0.0000021

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
PC-035	Cable	MCC-001	VFD-P-20A	5939.71	259.89	5945.39	
PC-036	Cable	VFD-P-20A	Bus16-1	492.24	21.54	492.71	
PC-037	Cable	MCC-001	Bus17-1	11896.90	260.49	11899.75	0.0000025
PC-038	Cable	MCC-001	VFD-P-06A	13254.09	343.74	13258.55	
PC-039	Cable	MCC-001	VFD-CT-01A	6169.42	269.94	6175.33	
PC-040	Cable	VFD-CT-01A	Bus11-1	492.24	21.54	492.71	
PC-041	Cable	MCC-001	Bus15-1	3315.53	72.60	3316.33	0.0000007
PC-042	Cable	MCC-001	Bus14-1	10271.64	224.91	10274.10	0.0000022
PC-043	Cable	MCC-001	VFD-C-04	2098.50	140.14	2103.17	
PC-044	Cable	VFD-C-04	Bus18	308.60	20.61	309.29	
PC-045	Cable	MCC-001	WRCP-01	226.31	15.11	226.81	
PC-046	Cable	MCC-002	Bus28-1	310.27	73.69	318.90	
PC-047	Cable	Bus22-1	DP-1	22.24	12.13	25.33	
PC-048	Cable	MCC-002	UPS By-Pass	1411.09	61.74	1412.44	
PC-049	Cable	MCC-001	Bus19-1	45.55	77.24	89.67	
PC-050	Cable	WRCP-01	WRCP-02	226.31	15.11	226.81	
PC-051	Cable	MCC-002	VFD-P-15C	8870.85	230.06	8873.83	
PC-052	Cable	VFD-P-15C	Bus26	521.81	13.53	521.99	
PC-053	Cable	LVSG-001-BO1	VFD-C-02	660.16	188.14	686.44	
PC-054	Cable	VFD-C-02	Bus41-1	99.02	28.22	102.97	
PC-055	Cable	MCC-002	Bus27-1	574.00	14.89	574.19	
PC-056	Cable	MCC-002	VFD-P-11	4725.52	206.76	4730.04	
PC-057	Cable	VFD-P-11	Bus23-1	393.79	17.23	394.17	
PC-058	Cable	MCC-002	VFD-P-20B	6399.14	279.99	6405.26	
PC-059	Cable	VFD-P-20B	Bus24-1	492.24	21.54	492.71	
PC-061	Cable	MCC-002	Bus21-1	8581.37	187.90	8583.43	0.0000018
PC-062	Cable	MCC-002	VFD-P-06B	17097.73	374.37	17101.83	0.0000036
PC-063	Cable	MCC-002	Bus3-1	715.11	15.66	715.29	0.0000002
PC-064	Cable	MCC-002	Bus20-1	5710.00	249.84	5715.46	
PC-065	Cable	MCC-002	Bus7-1	1411.09	61.74	1412.44	
PC-067	Cable	MCC-002	Bus12-1	3130.89	81.20	3131.94	
PC-068	Cable	MCC-002	WRCP-03	226.31	15.11	226.81	
PC-069	Cable	WRCP-03	WRCP-04	226.31	15.11	226.81	
PC-070	Cable	MCC-003	WRCP-06	226.31	15.11	226.81	
PC-071	Cable	MCC-003	VFD-C-03	3044.88	203.34	3051.66	
PC-072	Cable	VFD-C-03	Bus39-1	308.60	20.61	309.29	
PC-073	Cable	MCC-003	Bus35-1	12221.95	267.61	12224.88	0.0000026
PC-074	Cable	MCC-003	VFD-P-15B	8975.21	232.77	8978.23	
PC-075	Cable	VFD-P-15B	Bus50	521.81	13.53	521.99	



CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
PC-076	Cable	MCC-003	Bus43-1	9881.58	216.37	9883.95	0.0000021
PC-077	Cable	MCC-003	VFD-CT-01B	4279.29	285.78	4288.82	
PC-078	Cable	VFD-CT-01B	Bus37-1	308.60	20.61	309.29	
PC-079	Cable	MCC-003	Bus42-1	7671.23	167.97	7673.07	0.0000016
PC-080	Cable	MCC-003	VFD-P-06C	17877.86	391.45	17882.14	0.0000038
PC-081	Cable	MCC-003	Bus40	5590.89	122.42	5592.23	0.0000012
PC-083	Cable	WRCP-06	WRCP-05	226.31	15.11	226.81	
PC-084	Cable	MCC-003	VFD-P-37	9183.94	238.18	9187.03	
PC-085	Cable	VFD-P-37	Bus51	83.55	20.07	85.93	
PC-087	Cable	MCC-003	DP-5	287.31	43.47	290.58	
PC-088	Cable	MCC-003	Bus32	231.05	54.88	237.48	
PC-089	Cable	Bus31-1	DP-3	117.82	53.22	129.28	
PC-091	Cable	MCC-001	VFD-CT-01C	4279.29	285.78	4288.82	
PC-092	Cable	VFD-CT-01C	Bus10-1	308.60	20.61	309.29	
PC-093	Cable	MCC-002	VFD-CT-01D	7317.99	320.19	7324.99	
PC-094	Cable	VFD-CT-01D	Bus25-1	492.24	21.54	492.71	
PC-097	Cable	MCC-002	Bus33-1	244.26	58.01	251.05	
PC-098	Cable	Bus34-1	DP-7	488.10	220.47	535.58	
PC-113	Cable	VFD-C-01	Bus58	17.53	17.51	24.78	
PC-114	Cable	VFD-P-06A	Bus9-1	975.16	21.35	975.39	0.0000002
PC-115	Cable	VFD-P-06B	Bus13-1	975.16	21.35	975.39	0.0000002
PC-116	Cable	VFD-P-06C	Bus38-1	975.16	21.35	975.39	0.0000002
52-1	Tie Breakr	Bus4	MVSG-001				
BO1.MAIN	Tie Breakr	AT-1.	LVSG-001-BO1				
MTM	Tie Breakr	LVSG-001-BO1	LVSG-001-BO2				

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				% Positive Seq. Impedance 100 MVA Base			% Zero Seq. Impedance 100 MVA Base			
Power Grid	Connected Bus	Rating					Grounding			
ID	ID	MVASC	kV	X/R	R	X	Type	X/R	R0	X0
UTILITY	Bus1	87.300	20.800	7.40	15.35015	113.51440	Wye - Solid	6.50	25.670980	166.83570
Total Power Grids (= 1) 87.300 MVA										

Synchronous Generator					Positive Seq. Impedance					Grounding			Zero Seq. Impedance		
					Rating		% Xd''								
ID	Type	MVA	kV	RPM	X"/R	% R	Adj.	Tol.	% Xd'	Conn.	Type	Amp	X/R	% R0	% X0
CTG-1	Turbo	6.000	13.800	1800	48.00	0.250	12.00	0.0	23.00	Wye		5.00	48.00	0.250	12.00
DG-1	Turbo	0.938	0.480	1800	48.03	0.250	12.00	0.0	23.00	Wye	Resistor	3.00	48.03	0.250	12.00
STG-1	Turbo	1.250	13.800	1800	48.00	0.248	11.90	0.0	14.80	Wye		5.00	48.00	0.250	12.00
Total Connected Synchronous Generators (= 3): 8,188 MVA															

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Induction Machine Input Data

Induction Machine			Rating (Base)			Positive Seq. Imp.				Grounding			Zero Seq. Imp.		
ID	Type	Qty	kVA	kV	RPM	X"/R	% R	% X"	% X'	Conn.	Type	Amp	X/R	% R0	% X0
P-03-1	Motor	1	2.70	0.460	1800	1.10	25.271	27.83	9999.00	Wye	Open		1.10	25.271	27.83
P-06A-1	Motor	1	8.76	0.460	1800	2.13	13.050	27.83	9999.00	Wye	Open		2.13	13.050	27.83
CT-01C	Motor	1	27.09	0.460	1800	3.89	7.148	27.83	9999.00	Wye	Open		3.89	7.148	27.83
CT-01A	Motor	1	27.09	0.460	1800	3.89	7.148	27.83	9999.00	Wye	Open		3.89	7.148	27.83
P-06B-1	Motor	1	8.76	0.460	1800	2.13	13.050	27.83	9999.00	Wye	Open		2.13	13.050	27.83
P-34	Motor	1	0.88	0.460	1800	0.55	50.542	27.83	9999.00	Wye	Open		0.55	50.542	27.83
P-12	Motor	1	3.03	0.460	1800	0.95	29.181	27.83	9999.00	Wye	Open		0.95	29.181	27.83
P-20A-1	Motor	1	21.51	0.460	1800	3.48	7.991	27.83	9999.00	Wye	Open		3.48	7.991	27.83
P-07B-1	Motor	1	3.82	0.460	1800	1.35	20.634	27.83	9999.00	Wye	Open		1.35	20.634	27.83
C-04	Motor	1	41.43	0.460	1800	4.93	5.651	27.83	9999.00	Wye	Open		4.93	5.651	27.83
FN-01A-1	Motor	1	21.51	0.460	1800	3.48	7.991	27.83	9999.00	Wye	Open		3.48	7.991	27.83
P-33	Motor	1	0.88	0.460	1800	0.55	50.542	27.83	9999.00	Wye	Open		0.55	50.542	27.83
P-11-1	Motor	1	21.51	0.460	1800	3.48	7.991	27.83	9999.00	Wye	Open		3.48	7.991	27.83
P-20B-1	Motor	1	21.51	0.460	1800	3.48	7.991	27.83	9999.00	Wye	Open		3.48	7.991	27.83
CT-01D	Motor	1	27.09	0.460	1800	3.89	7.148	27.83	9999.00	Wye	Open		3.89	7.148	27.83
P-15C-1	Motor	1	11.15	0.460	1800	2.46	11.302	27.83	9999.00	Wye	Open		2.46	11.302	27.83
FN-02A-1	Motor	1	11.15	0.460	1800	2.46	11.302	27.83	9999.00	Wye	Open		2.46	11.302	27.83
P-15A-1	Motor	1	11.15	0.460	1800	2.46	11.302	27.83	9999.00	Wye	Open		2.46	11.302	27.83
P-07A	Motor	1	3.82	0.460	1800	1.35	20.634	27.83	9999.00	Wye	Open		1.35	20.634	27.83
CT-01B-1	Motor	1	27.09	0.460	1800	3.89	7.148	27.83	9999.00	Wye	Open		3.89	7.148	27.83
P-06C	Motor	1	8.76	0.460	1800	2.13	13.050	27.83	9999.00	Wye	Open		2.13	13.050	27.83
C-03	Motor	1	27.09	0.460	1800	3.89	7.148	27.83	9999.00	Wye	Open		3.89	7.148	27.83
P-13	Motor	1	3.03	0.460	1800	0.95	29.181	27.83	9999.00	Wye	Open		0.95	29.181	27.83
C-02	Motor	1	76.49	0.460	1800	6.74	2.965	20.00	50.00	Wye	Open		6.74	2.965	20.00
P-35	Motor	1	0.88	0.460	1800	0.55	50.542	27.83	9999.00	Wye	Open		0.55	50.542	27.83
P-08-1	Motor	1	6.06	0.460	1800	1.74	15.983	27.83	9999.00	Wye	Open		1.74	15.983	27.83
FN-04	Motor	1	98.79	0.460	1800	7.79	2.568	20.00	50.00	Wye	Open		7.79	2.568	20.00
P-15B-1	Motor	1	11.15	0.460	1800	2.46	11.302	27.83	9999.00	Wye	Open		2.46	11.302	27.83
P-37	Motor	1	16.73	0.460	1800	3.02	9.228	27.83	9999.00	Wye	Open		3.02	9.228	27.83
P-01C	Motor	1	76.49	0.460	1800	6.74	2.965	20.00	50.00	Wye	Open		6.74	2.965	20.00
P-01A	Motor	1	76.49	0.460	1800	6.74	2.965	20.00	50.00	Wye	Open		6.74	2.965	20.00
P-32	Motor	1	98.79	0.460	1800	7.79	2.568	20.00	50.00	Wye	Open		7.79	2.568	20.00
FN-05	Motor	1	98.79	0.460	1800	7.79	2.568	20.00	50.00	Wye	Open		7.79	2.568	20.00
C-01	Motor	1	240.62	0.460	1800	12.31	1.624	20.00	50.00	Wye	Open		12.31	1.624	20.00

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Induction Machine			Rating (Base)			Positive Seq. Imp.				Grounding			Zero Seq. Imp.		
ID	Type	Qty	kVA	kV	RPM	X"/R	% R	% X"	% X'	Conn.	Type	Amp	X/R	% R0	% X0
P-01B	Motor	1	76.49	0.460	1800	6.74	2.965	20.00	50.00	Wye	Open		6.74	2.965	20.00
CTG-M01	Motor	1	143.41	0.460	1800	9.54	2.097	20.00	50.00	Wye	Open		9.54	2.097	20.00

Total Connected Induction Machines (= 36): 1362.0 kVA