Electrical Transient Analyzer Program

Short-Circuit Analysis

IEC 60909 Standard

3-Phase, LG, LL, & LLG Fault Currents

	Swing	V-Control	Load	Total
Number of Buses:	1	0	89	90

	XFMR2	XFMR3	Reactor	Line/Cable/ Busway	Impedance	Tie PD	Total
Number of Branches:	37	0	0	46	2	3	88

	Synchronous Generator	Power Grid	Synchronous Motor	Induction Machines	Lumped Load	Inverter	Total
Number of Machines:	0	1	1	0	0	44	46

System Frequency:	50.00
Unit System:	Metric
Project Filename:	AES RENEWABLES
Output Filename:	C:\ETAP 2401\AES RENEWABLES\5A Grid-connected base.SI2S

Adjustments

Tolerance	Apply Adjustments	Individual /Global	Percent
Transformer Impedance:	Yes	Individual	
Reactor Impedance:	Yes	Individual	
Overload Heater Resistance:	No		
Transmission Line Length:	No		
Cable / Busway Length:	No		

Temperature Correction	Apply Adjustments	Individual /Global	Degree C
Transmission Line Resistance:	Yes	Individual	
Cable / Busway Resistance:	Yes	Individual	

Bus Input Data

Bus					Initial Voltage	
ID	Type	Nom. kV	Base kV	Sub-sys	%Mag.	Ang.
Bus2	Load	11.000	11.000	1	100.00	0.00
Bus3	Load	0.415	0.387	1	100.00	30.00
Bus8	Load	0.800	0.762	1	100.00	30.00
Bus9	Load	0.415	0.415	1	100.00	-30.00
Bus10	Load	0.415	0.415	28	100.00	0.00
Bus15	SWNG	11.000	11.000	1	100.00	0.00
Bus26	Load	11.000	11.000	1	100.00	0.00
Bus27	Load	11.000	11.000	1	100.00	0.00
Bus28	Load	11.000	11.000	1	100.00	0.00
Bus29	Load	11.000	11.000	1	100.00	0.00
Bus30	Load	11.000	11.000	1	100.00	0.00
Bus32	Load	11.000	11.000	1	100.00	0.00
Bus34	Load	11.000	11.000	1	100.00	0.00
Bus35	Load	11.000	11.000	1	100.00	0.00
Bus36	Load	11.000	11.000	1	100.00	0.00
Bus37	Load	11.000	11.000	1	100.00	0.00
Bus38	Load	11.000	11.000	1	100.00	0.00
Bus39	Load	11.000	11.000	1	100.00	0.00
Bus40	Load	11.000	11.000	1	100.00	0.00
Bus41	Load	11.000	11.000	1	100.00	0.00
Bus42	Load	11.000	11.000	1	100.00	0.00
Bus43	Load	11.000	11.000	1	100.00	0.00
Bus45	Load	0.415	0.415	1	100.00	-30.00
Bus46	Load	11.000	11.000	1	100.00	0.00
Bus47	Load	11.000	11.000	1	100.00	0.00
Bus48	Load	11.000	11.000	1	100.00	0.00
Bus49	Load	11.000	11.000	1	100.00	0.00
Bus50	Load	11.000	11.000	1	100.00	0.00
Bus51	Load	11.000	11.000	1	100.00	0.00
Bus52	Load	11.000	11.000	1	100.00	0.00
Bus54	Load	11.000	11.000	1	100.00	0.00
Bus55	Load	11.000	11.000	1	100.00	0.00
Bus56	Load	11.000	11.000	1	100.00	0.00
Bus57	Load	11.000	11.000	1	100.00	0.00
Bus59	Load	11.000	11.000	1	100.00	0.00
Bus60	Load	11.000	11.000	1	100.00	0.00
Bus61	Load	11.000	11.000	1	100.00	0.00
Bus62	Load	11.000	11.000	1	100.00	0.00
Bus63	Load	11.000	11.000	1	100.00	0.00
Bus64	Load	11.000	11.000	1	100.00	0.00
Bus65	Load	11.000	11.000	1	100.00	0.00

Bus					Initial Voltage	
ID	Type	Nom. kV	Base kV	Sub-sys	%Mag.	Ang.
Bus66	Load	11.000	11.000	1	100.00	0.00
Bus67	Load	11.000	11.000	1	100.00	0.00
Bus68	Load	11.000	11.000	1	100.00	0.00
Bus70	Load	11.000	11.000	1	100.00	0.00
Bus72	Load	11.000	11.000	1	100.00	0.00
Bus73	Load	11.000	11.000	1	100.00	0.00
Bus74	Load	11.000	11.000	1	100.00	0.00
Bus75	Load	11.000	11.000	1	100.00	0.00
Bus76	Load	11.000	11.000	1	100.00	0.00
Bus77	Load	11.000	11.000	1	100.00	0.00
Bus78	Load	11.000	11.000	1	100.00	0.00
Bus79	Load	11.000	11.000	1	100.00	0.00
Bus80	Load	11.000	11.000	1	100.00	0.00
Bus81	Load	0.415	0.405	1	100.00	-30.00
Bus82	Load	0.415	0.415	1	100.00	-30.00
Bus83	Load	0.415	0.415	1	100.00	-30.00
Bus84	Load	0.415	0.415	1	100.00	-30.00
Bus85	Load	0.415	0.415	1	100.00	-30.00
Bus86	Load	0.415	0.415	1	100.00	-30.00
Bus87	Load	0.415	0.405	1	100.00	30.00
Bus88	Load	0.415	0.415	1	100.00	-30.00
Bus89	Load	0.415	0.415	1	100.00	-30.00
Bus90	Load	0.415	0.415	1	100.00	-30.00
Bus91	Load	0.415	0.415	1	100.00	-30.00
Bus92	Load	0.415	0.415	1	100.00	-30.00
Bus93	Load	0.415	0.415	1	100.00	-30.00
Bus94	Load	0.415	0.425	1	100.00	-30.00
Bus95	Load	0.415	0.425	1	100.00	-30.00
Bus96	Load	0.415	0.415	1	100.00	-30.00
Bus97	Load	0.415	0.425	1	100.00	-30.00
Bus98	Load	0.415	0.425	1	100.00	-30.00
Bus99	Load	0.415	0.415	1	100.00	-30.00
Bus100	Load	0.415	0.415	1	100.00	-30.00
Bus101	Load	0.415	0.415	1	100.00	-30.00
Bus102	Load	0.415	0.425	1	100.00	-30.00
Bus103	Load	0.415	0.415	1	100.00	-30.00
Bus104	Load	0.415	0.415	1	100.00	-30.00
Bus105	Load	0.415	0.425	1	100.00	-30.00
Bus106	Load	0.415	0.425	1	100.00	-30.00
Bus107	Load	0.415	0.425	1	100.00	-30.00
Bus108	Load	0.415	0.415	1	100.00	-30.00
Bus109	Load	0.415	0.425	1	100.00	-30.00
Bus110	Load	0.415	0.425	1	100.00	-30.00

Bus					Initial Voltage	
ID	Type	Nom. kV	Base kV	Sub-sys	%Mag.	Ang.
Bus111	Load	0.415	0.425	1	100.00	-30.00
Bus112	Load	0.415	0.425	1	100.00	-30.00
Bus113	Load	0.800	0.753	1	100.00	30.00
Bus114	Load	0.800	0.753	1	100.00	30.00
Bus115	Load	0.415	0.415	1	100.00	-30.00
MV_BUS	Load	11.000	11.000	1	105.00	0.00

90 Buses Total

All voltages reported by ETAP are in % of bus Nominal kV.
Base kV values of buses are calculated and used internally by ETAP.

Line/Cable/Busway Input Data

ohms or siemens per 1000 m per Conductor (Cable) or per Phase (Line/Busway)

Line/Cable/Busway ID	Library	Size	Length Adj. (m)	Length % Tol.	#/Phase	T (°C)	R1	X1	Y1	R0	X0	Y0
Cable3	11NALS1	500	5.0	0.0	1	75	0.0749853	0.2006089	0.0001829	0.0754025	0.7152569	0.0001829
Line1		111	165.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line2		111	254.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line3		111	393.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line4		111	259.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line5		111	765.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line6		111	50.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line7		111	2600.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line8		111	3600.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line9		111	3300.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line10		111	1818.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line11		111	360.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line12		111	65.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line13		111	609.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line14		111	822.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line15		111	200.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line16		111	449.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line17		111	1660.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line18		111	2070.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line19		111	609.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line20		111	300.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line21		111	684.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line22		111	555.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line23		111	1100.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line24		111	491.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line25		111	200.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line26		111	335.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line27		111	149.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line28		111	119.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line29		111	300.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line30		111	90.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line31		111	150.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line32		111	332.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line33		111	200.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line34		111	100.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016

ohms or siemens per 1000 m per Conductor (Cable) or per Phase (Line/Busway)

Line/Cable/Busway			Length									
ID	Library	Size	Adj. (m)	% Tol.	#/Phase	T (°C)	R1	X1	Y1	R0	X0	Y0
Line35		111	132.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line36		111	132.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line37		111	100.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line38		111	142.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line39		111	100.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line40		111	700.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line41		111	250.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line42		111	1450.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line43		111	230.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line44		111	777.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016
Line45		111	1244.0	0.0	1	75	0.3140408	0.2910776	0.0000041	0.6379963	0.9624727	0.0000016

Line / Cable / Busway resistances are listed at the specified temperatures.

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
500KVA PRIMARY	0.500	11.000	0.415	5.00	3.50	0	0	0	5.000	2.500	5.00	Dyn	-30.00
AIRTEL BIRNIN YERO	0.050	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
ALHAJI BALA	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
Aux TR	0.250	11.000	0.415	7.50	3.50	0	0	0	0	0	7.50	Dyn	30.00
BABBAN GIDA	0.300	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
BIRNIN YERO 1	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
BIRNIN YERO 1 RELIEF	0.300	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
BIRNIN YERO 2	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
DANDAMI	0.100	11.000	0.415	5.00	3.50	0	0	0	0	2.500	5.00	Dyn	30.00
FIRST GATE	0.500	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
FOUNDATION	0.300	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
FRSC	0.100	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
HAYIN SADAUKI	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
HAYIN UMMA	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
HYDRAF WATER	0.300	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
IHS BOOSTER STATION	0.050	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
JAFI	0.500	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
KAHO VILLAGE	0.300	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
KAMPANIN PATE RELIEF	0.300	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
KAN ZAURE	0.200	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
KANGADA	0.500	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
KARGO DAM	0.300	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
MTN BIRNIN YER0	0.050	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
POLICE DIVISION HG	0.200	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
PROPOSED KWARAU	0.200	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
VILLAGE R PULLO FARM	0.100	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
SHEHU KARAWU	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
SKYPET	0.200	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
STS	6.600	11.000	0.800	7.50	3.50	0	0	0	5.000	0	7.50	Dyn	-30.00
STS 2	6.600	11.000	0.800	8.35	13.00	0	0	0	6.250	0	8.35	Dyn	-30.00
T2	5.000	11.000	0.415	7.15	8.50	0	0	0	7.300	0	7.15	Dyn	-30.00
T10	0.100	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00
TSOHON BIRNIN YERO	0.300	11.000	0.415	4.00	1.50	0	0	0	0	0	4.00	Dyn	30.00
U/ RIMI	0.200	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00

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
URWA	0.050	11.000	0.415	4.00	1.50	0	0	0	0	2.500	4.00	Dyn	30.00
ZARIA ROAD 1 500KVA	0.500	11.000	0.415	4.00	1.50	0	0	0	5.000	2.500	4.00	Dyn	30.00
ZARIA ROAD 2	0.300	11.000	0.415	5.00	3.50	0	0	0	0	0	5.00	Dyn	30.00

2-Winding Transformer Grounding Input Data

Transformer	Rating			Conn.	Grounding							
					Primary				Secondary			
ID	MVA	Prim. kV	Sec. kV	Type	Type	kV	Amp	ohm	Type	kV	Amp	ohm
500KVA PRIMARY	0.500	11.000	0.415	D/Y					Solid			
AIRTEL BIRNIN YERO	0.050	11.000	0.415	D/Y					Solid			
ALHAJI BALA	0.300	11.000	0.415	D/Y					Solid			
Aux TR	0.250	11.000	0.415	D/Y					Solid			
BABBAN GIDA	0.300	11.000	0.415	D/Y					Solid			
BIRNIN YERO 1	0.300	11.000	0.415	D/Y					Solid			
BIRNIN YERO 1 RELIEF	0.300	11.000	0.415	D/Y					Solid			
BIRNIN YERO 2	0.300	11.000	0.415	D/Y					Solid			
DANDAMI	0.100	11.000	0.415	D/Y					Solid			
FIRST GATE	0.500	11.000	0.415	D/Y					Solid			
FOUNDATION	0.300	11.000	0.415	D/Y					Solid			
FRSC	0.100	11.000	0.415	D/Y					Solid			
HAYIN SADAUKI	0.300	11.000	0.415	D/Y					Solid			
HAYIN UMMA	0.300	11.000	0.415	D/Y					Solid			
HYDRAF WATER	0.300	11.000	0.415	D/Y					Solid			
IHS BOOSTER STATION	0.050	11.000	0.415	D/Y					Solid			
JAFI	0.500	11.000	0.415	D/Y					Solid			
KAHO VILLAGE	0.300	11.000	0.415	D/Y					Solid			
KAMPANIN PATE RELIEF	0.300	11.000	0.415	D/Y					Solid			
KAN ZAURE	0.200	11.000	0.415	D/Y					Solid			
KANGADA	0.500	11.000	0.415	D/Y					Solid			
KARGO DAM	0.300	11.000	0.415	D/Y					Solid			
MTN BIRNIN YER0	0.050	11.000	0.415	D/Y					Solid			
POLICE DIVISION HG	0.200	11.000	0.415	D/Y					Solid			
PROPOSED KWARAU VILLAGE R	0.200	11.000	0.415	D/Y					Solid			
PULLO FARM	0.100	11.000	0.415	D/Y					Solid			

2-Winding Transformer Grounding Input Data

Transformer	Rating			Conn.	Grounding							
					Primary				Secondary			
ID	MVA	Prim. kV	Sec. kV	Type	Type	kV	Amp	ohm	Type	kV	Amp	ohm
SHEHU KARAWU	0.300	11.000	0.415	D/Y					Solid			
SKYPET	0.200	11.000	0.415	D/Y					Solid			
STS	6.600	11.000	0.800	D/Y					Solid			
STS 2	6.600	11.000	0.800	D/Y					Solid			
T2	5.000	11.000	0.415	D/Y					Solid			
T10	0.100	11.000	0.415	D/Y					Solid			
TSOHON BIRNIN YERO	0.300	11.000	0.415	D/Y					Solid			
U/ RIMI	0.200	11.000	0.415	D/Y					Solid			
URWA	0.050	11.000	0.415	D/Y					Solid			
ZARIA ROAD 1 500KVA	0.500	11.000	0.415	D/Y					Solid			
ZARIA ROAD 2	0.300	11.000	0.415	D/Y					Solid			

Impedance Input Data

Impedance	Positive Sequence Impedanc			Zero Sequence Impedance			
ID	R	X	Y	R0	X0	Y0	Unit
Z4	0.001	0.001	0	0.001	0.001	0	% in 0.800 kV base and 100.0 MVA base
Z5	0.001	0.001	0.001	0.001	0.001	0.001	% in 0.415 kV base and 100.0 MVA base

Branch Connections

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
500KVA PRIMARY	2W XFMR	Bus26	Bus87	293.65	1027.78	1068.91	
AIRTEL BIRNIN YERO	2W XFMR	Bus64	Bus107	4339.84	6509.77	7823.77	
ALHAJI BALA	2W XFMR	Bus74	Bus108	723.31	1084.96	1303.96	
Aux TR	2W XFMR	MV_BUS	Bus115	788.01	2758.02	2868.39	
BABBAN GIDA	2W XFMR	Bus38	Bus83	443.92	1553.72	1615.89	
BIRNIN YERO 1	2W XFMR	Bus56	Bus96	723.31	1084.96	1303.96	
BIRNIN YERO 1 RELIEF	2W XFMR	Bus47	Bus97	723.31	1084.96	1303.96	
BIRNIN YERO 2	2W XFMR	Bus60	Bus100	723.31	1084.96	1303.96	
DANDAMI	2W XFMR	Bus54	Bus94	1331.76	4661.15	4847.67	
FIRST GATE	2W XFMR	Bus40	Bus90	266.35	932.23	969.53	
FOUNDATION	2W XFMR	Bus76	Bus112	723.31	1084.96	1303.96	
FRSC	2W XFMR	Bus72	Bus109	2169.92	3254.88	3911.88	
HAYIN SADAUKI	2W XFMR	Bus62	Bus99	723.31	1084.96	1303.96	
HAYIN UMMA	2W XFMR	Bus57	Bus103	723.31	1084.96	1303.96	
HYDRAF WATER	2W XFMR	Bus79	Bus110	723.31	1084.96	1303.96	
IHS BOOSTER STATION	2W XFMR	Bus32	Bus86	2663.51	9322.29	9695.33	
JAFI	2W XFMR	Bus68	Bus104	433.98	650.98	782.38	
KAHO VILLAGE	2W XFMR	Bus36	Bus82	443.92	1553.72	1615.89	
KAMPANIN PATE RELIEF	2W XFMR	Bus41	Bus92	443.92	1553.72	1615.89	
KAN ZAURE	2W XFMR	Bus52	Bus91	665.88	2330.57	2423.83	
KANGADA	2W XFMR	Bus39	Bus88	266.35	932.23	969.53	
KARGO DAM	2W XFMR	Bus35	Bus84	443.92	1553.72	1615.89	
MTN BIRNIN YER0	2W XFMR	Bus63	Bus102	4339.84	6509.77	7823.77	
POLICE DIVISION HG	2W XFMR	Bus65	Bus106	1084.96	1627.44	1955.94	
PROPOSED KWARAU VILLAGE R	2W XFMR	Bus59	Bus98	1084.96	1627.44	1955.94	
PULLO FARM	2W XFMR	Bus78	Bus111	2169.92	3254.88	3911.88	
SHEHU KARAWU	2W XFMR	Bus61	Bus101	723.31	1084.96	1303.96	
SKYPET	2W XFMR	Bus67	Bus105	1084.96	1627.44	1955.94	
STS	2W XFMR	MV_BUS	Bus8	32.91	115.18	119.79	
STS 2	2W XFMR	MV_BUS	Bus114	10.41	135.29	135.69	
T2	2W XFMR	MV_BUS	Bus3	18.40	156.44	157.52	
T10	2W XFMR	Bus43	Bus89	1331.76	4661.15	4847.67	
TSOHON BIRNIN YERO	2W XFMR	Bus49	Bus93	723.31	1084.96	1303.96	
U/ RIMI	2W XFMR	Bus34	Bus85	665.88	2330.57	2423.83	
URWA	2W XFMR	Bus55	Bus95	4339.84	6509.77	7823.77	
ZARIA ROAD 1 500KVA	2W XFMR	Bus29	Bus81	478.47	717.70	862.57	

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
ZARIA ROAD 2	2W XFMR	Bus30	Bus45	443.92	1553.72	1615.89	
Cable3	Cable	Bus15	MV_BUS	0.03	0.08	0.09	0.0001107
Z4	Impedance	Bus114	Bus113	0.00	0.00	0.00	
Z5	Impedance	Bus115	Bus9	0.00	0.00	0.00	0.0010000
Line1	Line	Bus2	Bus26	4.28	3.97	5.84	0.0000819
Line2	Line	Bus26	Bus27	6.59	6.11	8.99	0.0001261
Line3	Line	Bus28	Bus30	10.20	9.45	13.91	0.0001951
Line4	Line	Bus27	Bus29	6.72	6.23	9.17	0.0001286
Line5	Line	Bus27	Bus32	19.85	18.40	27.07	0.0003797
Line6	Line	Bus32	Bus34	1.30	1.20	1.77	0.0000248
Line7	Line	Bus34	Bus35	67.48	62.55	92.01	0.0012906
Line8	Line	Bus32	Bus36	93.43	86.60	127.40	0.0017869
Line9	Line	Bus37	Bus38	85.65	79.38	116.78	0.0016380
Line10	Line	Bus27	Bus39	47.18	43.73	64.33	0.0009024
Line11	Line	Bus40	Bus41	9.34	8.66	12.74	0.0001787
Line12	Line	Bus39	Bus43	1.69	1.56	2.30	0.0000323
Line13	Line	Bus39	Bus40	15.81	14.65	21.55	0.0003023
Line14	Line	Bus48	Bus49	21.33	19.77	29.09	0.0004080
Line15	Line	Bus46	Bus64	5.19	4.81	7.08	0.0000993
Line16	Line	Bus56	Bus57	11.65	10.80	15.89	0.0002229
Line17	Line	Bus41	Bus48	43.08	39.93	58.74	0.0008240
Line18	Line	Bus48	Bus42	53.72	49.80	73.25	0.0010275
Line19	Line	Bus56	Bus51	15.81	14.65	21.55	0.0003023
Line20	Line	Bus42	Bus52	7.79	7.22	10.62	0.0001489
Line21	Line	Bus42	Bus54	17.75	16.45	24.21	0.0003395
Line22	Line	Bus54	Bus55	14.40	13.35	19.64	0.0002755
Line23	Line	Bus55	Bus56	28.55	26.46	38.93	0.0005460
Line24	Line	Bus56	Bus47	12.74	11.81	17.38	0.0002437
Line25	Line	Bus47	Bus59	5.19	4.81	7.08	0.0000993
Line26	Line	Bus56	Bus60	8.69	8.06	11.85	0.0001663
Line27	Line	Bus60	Bus61	3.87	3.58	5.27	0.0000740
Line28	Line	Bus51	Bus62	3.09	2.86	4.21	0.0000591
Line29	Line	Bus51	Bus50	7.79	7.22	10.62	0.0001489
Line30	Line	Bus50	Bus63	2.34	2.17	3.18	0.0000447
Line31	Line	Bus50	Bus46	3.89	3.61	5.31	0.0000745
Line32	Line	Bus46	Bus65	8.62	7.99	11.75	0.0001648
Line33	Line	Bus50	Bus66	5.19	4.81	7.08	0.0000993
Line34	Line	Bus66	Bus67	2.60	2.41	3.54	0.0000496
Line35	Line	Bus66	Bus68	3.43	3.18	4.67	0.0000655

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
Line36	Line	Bus66	Bus70	3.43	3.18	4.67	0.0000655
Line37	Line	Bus70	Bus72	2.60	2.41	3.54	0.0000496
Line38	Line	Bus70	Bus73	3.69	3.42	5.03	0.0000705
Line39	Line	Bus73	Bus74	2.60	2.41	3.54	0.0000496
Line40	Line	Bus73	Bus75	18.17	16.84	24.77	0.0003475
Line41	Line	Bus75	Bus76	6.49	6.01	8.85	0.0001241
Line42	Line	Bus75	Bus77	37.63	34.88	51.31	0.0007197
Line43	Line	Bus77	Bus78	5.97	5.53	8.14	0.0001142
Line44	Line	Bus80	Bus79	20.17	18.69	27.50	0.0003857
Line45	Line	Bus77	Bus80	32.29	29.93	44.02	0.0006175
CB2	Tie Breakr	MV_BUS	Bus2				
CB32	Tie Breakr	Bus36	Bus37				
CB33	Tie Breakr	Bus29	Bus28				

Power Grid Input Data

Power Grid ID	Connected Bus ID	Rating MVAsc	Rating kV	% Impedance 100 MVA Base R	% Impedance 100 MVA Base X"	% Impedance 100 MVA Base R/X"	Grounding Type
U1	Bus15	100.000	11.000	9.95037	99.50372	0.10	Wye - Solid

Total Connected Power Grids (= 1): 100.000 MVA

Synchronous Motor Input Data

Synchronous Motor			Connected Bus	Rating				
ID	Type	Qty	ID	HP/kW	kVA	kV	Amp	%PF
Syn1	Motor	1	Bus87	7.00	8.22	0.415	11.44	85.69

Total Connected Synchronous Motors (= 1): 8.2 kVA

Synchronous Motor			% Impedance in Motor Base				Grounding			
				Xd"						
ID	Type	Qty	R	Adj.	Tol.	R/X	Conn.	Type	Amp	Exciter Type
Syn1	Motor	1	8.089	16.67	0.0	0.49	Wye	Open		Turbine 130%

UPS Input Data

	AC Rating							DC Rating			Bypass	% Impedance Equipment Base	
		kV		FLA									
ID	kVA	Input	Output	Input	Output	% EFF	% PF	V	FLA	% Imax	Switch	R	X
UPS1	20.00	0.415	0.415	30.92	27.82	90.00	85.00	49.51	362.441	150.0	No	66.67	0.00

SHORT- CIRCUIT REPORT

Fault at bus: **Bus8**
Nominal kV = 0.800
Voltage c Factor = 1.05 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus8	Total	0.00	40.450	0.00	105.85	110.50	48.617	48.617	4.39E+001	2.25E+002	3.29E+001	1.15E+002
MV_BUS	Bus8	60.27	38.126	88.71	80.46	116.95	44.744	48.617 *	4.92E+001	2.14E+002	3.29E+001	1.15E+002
PVA1	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA2	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA3	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA4	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA5	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA6	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA7	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA8	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA9	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA10	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA11	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA12	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA13	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA14	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA15	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA16	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA17	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA18	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA20	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
PVA21	Bus8	0.00	0.119	0.00	105.85	110.50	0.247	0.000				
Bus15	MV_BUS	60.31	2.391	88.72	80.48	116.95	1.392	0.000	1.14E+002	9.71E+001		
Bus115	MV_BUS	60.27	0.000	110.48	70.73	103.98	0.000	0.000				
Bus114	MV_BUS	62.20	0.296	68.53	101.24	105.26	0.251	0.000	3.03E+002	1.17E+003		
Bus3	MV_BUS	56.17	0.000	65.92	96.91	102.97	0.000	0.000				
Bus26	Bus2	60.27	0.001	88.71	80.47	116.95	0.001	0.000	1.53E+005	2.72E+005		

(Cont.)

Fault at bus: **Bus8**
Nominal kV = 0.800
Voltage c Factor = 1.05 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0

		3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms)	:	40.450	48.617	36.191	48.881
Peak Current (kA), Method C	:	86.383	103.823	77.288	104.387
Breaking Current (kA, rms, symm)	:		48.617	36.191	48.881
Steady State Current (kA, rms)	:	40.450	48.617	36.191	48.881

# Indicates a fault current contribution from a three-winding transformer.
* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta- Y transformer.

Fault at bus: **Bus40**
Nominal kV = 11.000
Voltage c Factor = 1.10 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus40	Total	0.00	3.212	0.00	120.53	125.80	2.519	2.519	8.49E+001	1.78E+002	1.56E+002	2.70E+002
Bus41	Bus40	0.00	0.000	0.00	120.53	125.80	0.000	0.000				
Bus39	Bus40	13.19	3.212	16.08	116.75	122.48	2.519	2.519	8.88E+001	1.56E+002	1.56E+002	2.70E+002
Bus90	Bus40	0.00	0.000	72.63	69.59	112.93	0.000	0.000				
Bus48	Bus41	0.00	0.000	0.00	120.53	125.80	0.000	0.000				
Bus92	Bus41	0.00	0.000	72.63	69.59	112.93	0.000	0.000				
Bus27	Bus39	52.57	3.212	64.09	106.69	113.88	2.519	2.519	7.30E+001	1.42E+002	1.24E+002	2.22E+002
Bus43	Bus39	13.19	0.000	16.08	116.75	122.48	0.000	0.000				
Bus88	Bus39	13.19	0.000	77.67	71.73	112.93	0.000	0.000				

		3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms)	:	3.212	2.519	2.667	2.981
Peak Current (kA), Method C	:	5.595	4.387	4.645	5.192
Breaking Current (kA, rms, symm)	:		2.519	2.667	2.981
Steady State Current (kA, rms)	:	3.212	2.519	2.667	2.981

# Indicates a fault current contribution from a three-winding transformer.
* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta- Y transformer.

Fault at bus: **Bus70**
Nominal kV = 11.000
Voltage c Factor = 1.10 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus70	Total	0.00	1.304	0.00	135.00	129.00	0.900	0.900	2.84E+002	3.62E+002	5.61E+002	8.80E+002
Bus66	Bus70	1.16	1.304	1.25	134.64	128.74	0.900	0.900	3.07E+002	3.19E+002	5.61E+002	8.80E+002
Bus72	Bus70	0.00	0.000	0.00	135.00	129.00	0.000	0.000				
Bus73	Bus70	0.00	0.000	0.00	135.00	129.00	0.000	0.000				
Bus50	Bus66	2.92	1.304	3.13	134.10	128.34	0.900	0.900	3.04E+002	3.16E+002	5.54E+002	8.70E+002
Bus67	Bus66	1.16	0.000	1.25	134.64	128.74	0.000	0.000				
Bus68	Bus66	1.16	0.000	1.25	134.64	128.74	0.000	0.000				
Bus109	Bus72	0.00	0.000	76.34	79.89	114.93	0.000	0.000				
Bus74	Bus73	0.00	0.000	0.00	135.00	129.00	0.000	0.000				
Bus75	Bus73	0.00	0.000	0.00	135.00	129.00	0.000	0.000				

		3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms)	:	1.304	0.900	1.115	1.195
Peak Current (kA), Method C	:	2.044	1.411	1.748	1.873
Breaking Current (kA, rms, symm)	:		0.900	1.115	1.195
Steady State Current (kA, rms)	:	1.304	0.900	1.115	1.195

\# Indicates a fault current contribution from a three-winding transformer.
* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta- Y transformer.

Fault at bus: **Bus110**
Nominal kV = 0.415
Voltage c Factor = 1.05 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus110	Total	0.00	7.480	0.00	103.27	101.19	8.368	8.368	1.12E+003	1.55E+003	7.23E+002	1.08E+003
Bus79	Bus110	71.86	7.480	88.48	105.41	86.16	8.368	8.368 *	1.24E+003	1.39E+003	7.23E+002	1.08E+003
Bus80	Bus79	73.33	0.289	89.11	105.41	87.05	0.187	0.000	1.04E+003	5.01E+002		

		3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms)	:	7.480	8.368	6.477	8.113
Peak Current (kA), Method C	:	11.934	13.352	10.335	12.943
Breaking Current (kA, rms, symm)	:		8.368	6.477	8.113
Steady State Current (kA, rms)	:	7.480	8.368	6.477	8.113

\# Indicates a fault current contribution from a three-winding transformer.
* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta- Y transformer.

Fault at bus: **Bus113**
Nominal kV = 0.800
Voltage c Factor = 1.05 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus113	Total	0.00	38.446	0.00	107.11	106.54	45.019	45.019	2.14E+001	2.45E+002	1.04E+001	1.35E+002
Bus114	Bus113	0.00	36.413	0.00	107.11	106.54	41.970	45.019	3.09E+001	2.33E+002	1.04E+001	1.35E+002
PCS 1	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 2	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 3	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 4	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 5	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 6	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 7	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 8	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 9	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 10	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 11	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 12	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 13	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 14	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 15	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 16	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 17	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 18	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 19	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 20	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 21	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 22	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 23	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
PCS 24	Bus113	0.00	0.085	0.00	107.11	106.54	0.178	0.000				
MV_BUS	Bus114	64.44	36.413	87.76	86.32	117.31	41.970	45.019 *	3.09E+001	2.33E+002	1.04E+001	1.35E+002

(Cont.)

Fault at bus: **Bus113**
Nominal kV = 0.800
Voltage c Factor = 1.05 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0

		3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms)	:	38.446	45.019	34.020	44.857
Peak Current (kA), Method C	:	92.465	108.274	81.819	107.883
Breaking Current (kA, rms, symm)	:		45.019	34.020	44.857
Steady State Current (kA, rms)	:	38.446	45.019	34.020	44.857

# Indicates a fault current contribution from a three-winding transformer.
* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta- Y transformer.

Fault at bus: **MV_BUS**
Nominal kV = 11.000
Voltage c Factor = 1.10 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
MV_BUS	Total	0.00	5.586	0.00	106.18	108.16	7.080	7.080	1.10E+001	1.09E+002	6.25E+000	4.39E+001
Bus15	MV_BUS	0.09	5.245	0.20	106.13	108.14	6.648	7.080	1.10E+001	1.10E+002	6.25E+000	4.39E+001
Bus115	MV_BUS	0.00	0.000	62.45	61.30	118.85	0.000	0.000				
Bus8	MV_BUS	4.02	0.185	65.76	119.24	61.14	0.342	0.000	2.84E-004	3.12E+003		
Bus114	MV_BUS	3.80	0.156	64.79	116.91	59.22	0.292	0.000	3.23E-004	3.69E+003		
Bus3	MV_BUS	0.00	0.000	57.13	110.76	58.20	0.000	0.000				
Bus26	Bus2	0.00	0.003	0.00	106.18	108.16	0.002	0.000	1.00E+005	2.07E+005		
U1	Bus15	110.00	5.245	110.00	110.00	110.00	6.648	7.080	1.09E+001	1.09E+002	6.22E+000	4.36E+001
Bus9	Bus115	0.00	0.000	62.45	61.30	118.85	0.000	0.000				
PVA1	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA2	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA3	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA4	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA5	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA6	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA7	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA8	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA9	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA10	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA11	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA12	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA13	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA14	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA15	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA16	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA17	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA18	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA20	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
PVA21	Bus8	4.02	0.133	65.76	119.24	61.14	0.247	0.000				
Bus113	Bus114	3.80	2.284	64.79	116.91	59.22	4.261	0.000	1.84E+003	3.06E+003		
Bus27	Bus26	0.00	0.000	0.00	106.18	108.16	0.000	0.000				

(Cont.)

Fault at bus: **MV_BUS**
Nominal kV = 11.000
Voltage c Factor = 1.10 (User-Defined)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus	To Bus	% V	kA	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
ID	ID	From Bus	Symm. rms	Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus87	Bus26	0.50	0.003	59.96	115.99	61.01	0.002	0.000	1.00E+005	2.07E+005		

		3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms)	:	5.586	7.080	4.981	7.086
Peak Current (kA), Method C	:	13.435	17.026	11.979	17.042
Breaking Current (kA, rms, symm)	:		7.080	4.981	7.086
Steady State Current (kA, rms)	:	5.585	7.080	4.981	7.086

\# Indicates a fault current contribution from a three-winding transformer.
* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta- Y transformer.

Short-Circuit Summary Report

3-Phase, LG, LL, LLG Fault Currents

Bus		3-Phase Fault			Line-to-Ground Fault				Line-to-Line Fault				*Line-to-Line-to-Ground			
ID	kV	I"k	ip	Ik	I"k	ip	Ib	Ik	I"k	ip	Ib	Ik	I"k	ip	Ib	Ik
Bus8	0.800	40.450	86.383	40.450	48.617	103.823	48.617	48.617	36.191	77.288	36.191	36.191	48.881	104.387	48.881	48.881
Bus40	11.000	3.212	5.595	3.212	2.519	4.387	2.519	2.519	2.667	4.645	2.667	2.667	2.981	5.192	2.981	2.981
Bus70	11.000	1.304	2.044	1.304	0.900	1.411	0.900	0.900	1.115	1.748	1.115	1.115	1.195	1.873	1.195	1.195
Bus110	0.415	7.480	11.934	7.480	8.368	13.352	8.368	8.368	6.477	10.335	6.477	6.477	8.113	12.943	8.113	8.113
Bus113	0.800	38.446	92.465	38.446	45.019	108.274	45.019	45.019	34.020	81.819	34.020	34.020	44.857	107.883	44.857	44.857
MV_BUS	11.000	5.586	13.435	5.585	7.080	17.026	7.080	7.080	4.981	11.979	4.981	4.981	7.086	17.042	7.086	7.086

All fault currents are in rms kA. Current ip is calculated using Method C.

* LLG fault current is the larger of the two faulted line currents.

Sequence Impedance Summary Report

Bus		Positive Seq. Imp. (ohm)			Negative Seq. Imp. (ohm)			Zero Seq. Imp. (ohm)			Fault Zf (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
Bus8	0.800	0.00255	0.01304	0.01329	0.00255	0.01304	0.01329	0.00191	0.00669	0.00695	0.00000	0.00000	0.00000
Bus40	11.000	1.02670	2.15313	2.38539	1.02670	2.15313	2.38539	1.89141	3.26982	3.77745	0.00000	0.00000	0.00000
Bus70	11.000	3.43539	4.38569	5.57101	3.43539	4.38569	5.57101	6.78484	10.65199	12.62929	0.00000	0.00000	0.00000
Bus110	0.415	0.02025	0.02807	0.03461	0.02025	0.02807	0.03461	0.01309	0.01963	0.02359	0.00000	0.00000	0.00000
Bus113	0.800	0.00121	0.01388	0.01393	0.00121	0.01388	0.01393	0.00059	0.00767	0.00769	0.00000	0.00000	0.00000
MV_BUS	11.000	0.13297	1.32478	1.33144	0.13297	1.32478	1.33144	0.07567	0.53063	0.53599	0.00000	0.00000	0.00000

Branch (earth-fault factor) Summary Report

Bus		EFF/Ke (LG)	EFF/Ke (LLG)
ID	kV		
Bus8	0.800	1.22	1.03
Bus40	11.000	1.26	1.33
Bus70	11.000	1.35	1.39
Bus110	0.415	0.98	0.89
Bus113	0.800	1.21	1.07
MV_BUS	11.000	1.08	0.82