

LAMPIRAN

Lampiran berisi data rating *MBFP*, data *MCR26*, Single line diagram serta data-data lengkap dari analisa gangguan hubung singkat pada relay proteksi yang disimulasikan dengan *software ETAP12.60*

Attachment - 2

1. Manufacturee	TOSHIBA (TMEIC)	
2. Service name	Boiler Feed Water Pump	
3. System Identification Number	3FW-M320, 3FW-M321	
	4FW-M320, 4FW-M321	
4. Type	TIKE-RCCN	
5. Output(kW)	5600	(kW)
6. Voltage (V)	10000	(V)
7. Normal current (A)	379	(A)
8. Number of pole	4	
9. Rated power factor	0.89	
10. Speed (rpm) Synchronous/ Rated speed	1500/ 1485	(rpm)
11. IP Class (minimum IP55 or 55W)	IP55	
12. Locked rotor current (A)	1706	(A)
13. Starting time (second)	9.0	(sec.)
14. Load characteristics		
1) Efficiency	at 100% load	96.1 (%)
	at 75% load	95.7 (%)
	at 50% load	94.8 (%)
	at 25% load	91.3 (%)
2) Power factor	at rated condition	0.89
	at starting condition	0.15
15. Service factor	1.0	
16. Insulation class	F Class	
17. Temperature rise	limited to B Class insulation	
18. Location (Indoor / Out door)	Indoor	
19. Noise level at no load conditions	79	dB(A)
20. Direction of rotation (viewed from non-coupling side) CW		
21. Slip at Full load condition	1.0	(%)
22. GD ² (kg·m ²)	880	(kg·m ²)
23. Load ratio: Load torque at motor rated slip × 100(%)		
Motor rated torque	18.1	(%)
24. Stator winding connection	Wye/Delta	
25. Lubrication type	Turbine Oil	
Grease brand / type	ISO VG12	

26. Weight	Please see Outline drawing	
Number of start allowed from cold condition per hour	2	Cold
Number of start allowed from hot condition per hour	1	Hot
27. Minimum time between 2 starts	Cold 0 min./ Hot 60 min.	
28. Max. allowable time at locked rotor condition		
1) Hot condition	15	(sec.)
2) Cold condition	20	(sec.)
29. Numbers of starting times per year (guaranteed)	N.A.	
30. Space heater (AC 220V 1 phase)	<input checked="" type="radio"/> Yes	<input type="radio"/> No KW
31. Attachment document number		
1) Outline drawing		
2) Terminal Box drawings (For main power, space heater, instruments etc.)		
3) Characteristics Curves of CT	N.A.	
4) Outline drawing of CT and terminal strip with short-circuit links	N.A.	
5) Efficiency curves	N.A.	
6) Thermal curve of the motor from cold condition (thermal state = 0%) and from hot condition (thermal state = 90%)	D0-33E82306-A	
7) Rotor stalled curve at $1.5U_n$ and $0.8U_n$	N.A.	
8) Starting and speed torque characteristics at 80%, 90% and 100% voltage.	D0-33E82305-A	

MAIN SPECIFICATIONS

Item	Specifications	Remarks	
Control power voltage	100V-240V AC and DC (momentary interruption, 30ms permitted)	Turn on power to one of the units at a time to prevent rush current.	
Control power consumption	35VA (MAX)		
Allowable voltage variation	80-110%		
Main circuit configuration	3-phase 3-wire, or single phase 2-wire		
Rated frequency	50Hz or 60Hz		
CT primary rating	5A-9556A		
CT secondary rating	1A/5A		
VT primary rating	100V-77000V		
VT secondary rating	100V/110V/120V		
EVT tertiary rating	100V/110V/190V		
Applicable environment	Ambient temperature	Operation guarantee temperature: -5 ~ +55°C Storage temperature: -25 ~ +70°C	
	Humidity	10-85%RH (non condensing)	
	Atmosphere	No much dust. No corrosive gas.	
	Altitude	≤ 2000m	
Performance	Withstanding voltage	2kV 1min. Electric circuits collectively, and to the earth. Between electric circuits.	IEC60255-5 Except TRD output and transmission I/O
	Impulse withstanding voltage	5000V 1.2/50µs Electric circuits collectively, and to the earth. Between electric circuits.	
	Insulation resistance	> 100MΩ with 500 VDC insulation-resistance megger Electric circuits collectively, and to the earth. Between electric circuits.	
	Withstanding current	Rated current x 3 continuous Rated current x 40 1 sec. twice	(For information) Rated current x 100 1 sec. once
	Withstanding vibration	10-65Hz: Amplitude 0.035mm 60-150Hz: Acceleration 0.5g	IEC60255-21-1 Class I
	Withstanding impact	Acceleration 5g Pulse interval 11ms	IEC60255-21-2 Class I
	Withstanding seismic wave	1-9Hz: Horizontal amplitude 3.5mm Vertical amplitude 1.5mm 9-35Hz: Horizontal acceleration 1g Vertical acceleration 0.5g	IEC60255-21-3 Class I
	Withstanding noise	Common mode: 2.5kV Normal mode: 1.0kV	IEC60255-22-1 Class II
	Withstanding static charge	Contact discharge: 8kV Air-gap discharge: 8kV	IEC60255-22-2 Class II
	Withstanding electromagnetic noise	10V/m	IEC60255-22-3 Class II
	Withstanding first transient noise	4kV, 2.5kHz, 5/50ns	IEC60255-22-4
Burden to detection transformer	CT secondary burden	≤ 0.2VA	
	VT secondary burden	≤ 0.1VA	
	EVT tertiary burden	≤ 0.5VA	
	ZCT secondary burden	With each grounding protective function (see pages 12,13)	

Functions

Protective functions

 Protective function rated values and operation values

Function	Rating	Load	Operation value	Operation time	Reset time	Remarks
51 	Common to 1A and 5A	0.2VA	0.1-3.2 times of CT secondary rating (in 0.1 time steps) Accuracy: ±5%	Characteristics: inverse time*1 0.05 - 200 times of basic curve (in 0.05 time steps) definite time 0.1 - 4 s (in 0.1s steps) 4 - 30 s (in 1s steps) 30 - 90 s (in 5s steps) Accuracy: ±5% or 50 ms, whichever is larger	Trip output 100 - 150ms General output 200 - 300ms	-Lockable
50 			1-20 times of CT secondary rating (in 1 time steps) Accuracy: ±5%	Characteristic: At the time of fixed time-limitation 0.05 - 0.3 s (in 0.05s steps) 0.3 - 2.0 s (in 0.1s steps) Accuracy: ±5% or 50 ms, whichever is larger.	Trip output 100 - 150ms General output 200 - 300ms	-Lockable
51G 			0.1-1.0 times of CT secondary residual circuit rating (in 0.1 time steps) Accuracy: ±5%	Characteristics: inverse time*1 0.05 - 200 times of basic curve (in 0.05 time steps) definite time 0.1 - 4 s (in 0.1s steps) 4 - 30 s (in 1s steps) 30 - 90 s (in 5s steps) Accuracy: ±5% or 50 ms, whichever is larger	Trip output 100 - 150ms General output 200 - 300ms	-Lockable
50G 			0.1-10 times of CT secondary residual circuit rating (in 0.1 time steps) Accuracy: ±5%	Characteristics: At the time of fixed time-limitation 0.05 - 0.3 s (in 0.05s steps) 0.3 - 2.0 s (in 0.1s steps) Accuracy: ±5% or 50 ms, whichever is larger.	Trip output 100 - 150ms General output 200 - 300ms	-Lockable
27 	Common to 100V, 110V and 120V	0.1VA	VT secondary 30V-rating value (in 5V steps) Accuracy: ±5%	definite time 0.1 - 4 s (in 0.1s steps) 4 - 30 s (in 1s steps) 30 - 90 s (in 5s steps) Accuracy: ±5% or 50 ms, whichever is larger	Trip output 100 - 150ms General output 200 - 300ms	-Lockable -Available too separate 27 protection
50 			VT secondary rating value=140V (in 5V steps) Accuracy: ±5%	definite time 0.1 - 4 s (in 0.1s steps) 4 - 30 s (in 1s steps) 30 - 90 s (in 5s steps) Accuracy: ±5% or 50 ms, whichever is larger	Trip output 100 - 150ms General output 200 - 300ms	-Lockable
64 	Common to 100V, 110V and 180V	0.5VA	EV7 tertiary 10 - 60V (in 5V steps) Accuracy: ±5%	definite time 0.1 - 4 s (in 0.1s steps) 4 - 30 s (in 1s steps) 30 - 90 s (in 5s steps) Accuracy: ±5% or 50 ms, whichever is larger	Trip output 100 - 150ms General output 200 - 300ms	-Lockable

*1 See pages 25-37 for details of the characteristics curve at the time of anti-time-limitation.

Function	Rating	Lead	Operation value	Operation time	Reset time	Remarks
67G [↓]	Non-Grounding system Common to 100V, 110V and 190V 0.02A	EVT: 0.5VA ZCT: less than 10Ω	I _o : ZCT secondary 2 – 8mA (in 1mA steps) V _o : EVT tertiary 15V (fixed) The maximum sensitive angle is Lead 30° (fixed) Accuracy: ±5%	definite time 0.1 – 4 s (in 0.1s steps) 4 – 30 s (in 1s steps) 30 – 90 s (in 5s steps) Accuracy: ±5% or 50 ms, whichever is larger	Trip output 100 – 150ms General output 200 – 300ms	- Lockable
	10A Grounding system Common to 100V, 110V and 190V 0.2A	EVT: 0.5VA ZCT: 2Ω	I _o : ZCT secondary 10 – 100mA (in 10mA steps) V _o : EVT tertiary 15V (fixed) The maximum sensitive angle is Lead 30° (fixed) Accuracy: ±5%			
	30A Grounding system Common to 100V, 110V and 190V 0.5A	EVT: 0.5VA ZCT: 0.8Ω	I _o : ZCT secondary 100 – 300mA (in 20mA steps) V _o : EVT tertiary 15V (fixed) The maximum sensitive angle is Lead 30° (fixed) Accuracy: ±5%			
49 ^d [>]	Common to 1A and 5A	0.2VA	0.20 – 1.05 times of CT secondary rating (in 0.01 time steps) Accuracy: 1%±5%	2 – 90 seconds (in 1s steps) Accuracy: ±5% or 50 ms, whichever is larger. (when the current is 5 times larger than the operating value.)	Without HOT: Trip output 100 – 150ms General output 200 – 300ms With HOT: It changes with each conditions.	- Lockable - Characteristic is selectable between with HOT and without HOT. - For protection type "A" & "C"
			Motor rated current: 40–100% of CT rated current. Motor heating time constant: 10–160min. Motor cooling time constant: 10–500min. Stator allowable temperature rise: 60–125°C Stator rated: 100% load/temperature rise: 10–125°C Accuracy: Operation value ±3% Operation time: ±3% or 50ms whichever is larger	It changes with each conditions.		
51LR	Common to 1A and 5A	0.2VA	Allowable locking time: 1–120 sec. Starting current: 1.5–15times of motor rated current. Accuracy: Operation value ±5% Operation time: ±3% or 50ms whichever is larger		It changes with each conditions.	- Lockable
51BF	-	-	Tripping operation of whichever is applicable as 50, 51, 50Q, 51Q, 67Q, or 49 (to be selected by setting.)	0.2 – 1.0 sec.	General output 200 – 300ms	- Lockable

*2 [49] protective operation is different according as protective function type of MCR26.

Lampiran 3 Data Rekomendasi Seting MCR26

TOSHIBA

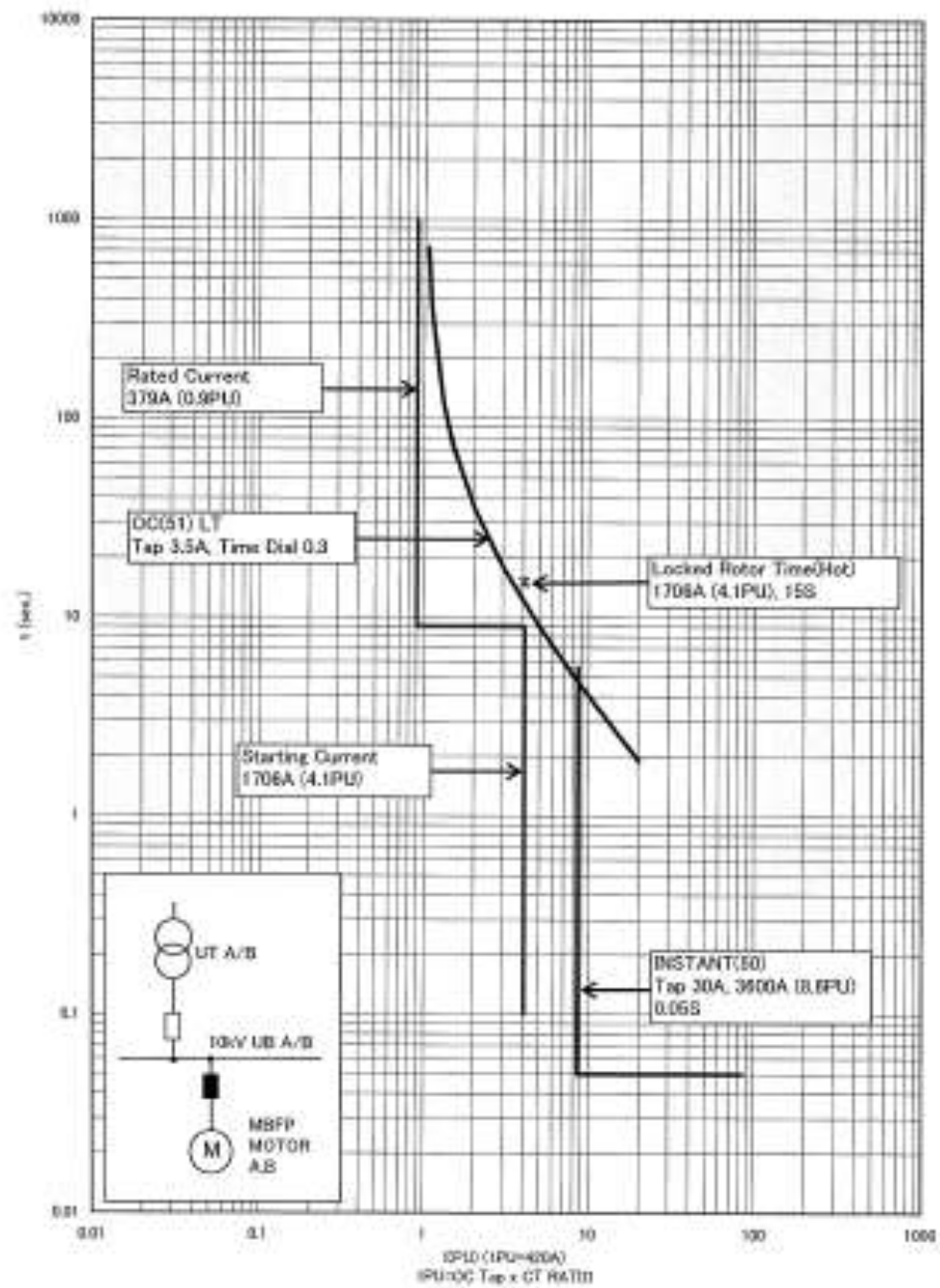
CAL-GEH-XIT3-0012 Rev. 2

10KV UNIT BOARD (4/4)

MOTOR MVL SWITCH	FEEDER NAME	DATA OF LOAD				CT RATIO	OCB SETTING			OCB SETTING (MIN)			
		CAPACITY (kW)	RATED CURRENT (A)	STARTING CURRENT (A)	Starting Time (sec)		LOCKED MOTOR TIME (sec)	CURRENT LIMIT	TRIP TIME	TRIP CURRENT	TRIP TIME	TRIP CURRENT	
A B	CONDENSATE EXTRACTION PUMP A, B (Unit 3, 4)	1500KW	105A	425A	35	12/165	SE	4A (80%)	1.5	40A (8 FC)	0.035 (Fixed)	1.4A	1.05
		3000KW	375A	1755A	55	14/205	1T	3.5A (10%) 3.5A	0.3	30A (8 FC)	0.035 (Fixed)	0.4A	1.05
A B	SPARE (Unit 3, 4)	-	-	-	-	-	-	-	-	-	-	0.4A	1.05

10kV UNIT BOARD

MBFP MOTOR A, B (Unit3, 4)
(3FW-P300/310), (4FW-P300/310)



Project: KOORDINASI OCR & OCG
Location: PLTU TANJUNG JATI B
Contract:
Engineer: EKO SISWANTO
Filename: SKRIPSI

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Electrical Transient Analyzer Program

Short-Circuit Analysis

**IEC 60909 Standard
3-Phase, LG, LL, & LLG Fault Currents**

	<u>Swing</u>	<u>V. Control</u>	<u>Load</u>	<u>Total</u>
Number of Buses:	1	0	19	20

	<u>XFMR2</u>	<u>XFMR3</u>	<u>Reactor</u>	<u>Line/Cable</u>	<u>Impedance</u>	<u>Tie PD</u>	<u>Total</u>
Number of Branches:	7	0	0	12	0	0	19

	<u>Synchronous Generator</u>	<u>Power Grid</u>	<u>Synchronous Motor</u>	<u>Induction Machines</u>	<u>Lumped Load</u>	<u>Total</u>
Number of Machines:	1	0	0	6	0	7

System Frequency: 50.00 Hz
Unit System: Metric
Project Filename: Diagram_Skripsi
Output Filename: C:\ETAP 1260\Diagram_Skripsi\Untitled.SI2

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Engineer:
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Adjustments

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

<u>Temperature Correction</u>	<u>Apply Adjustments</u>	<u>Individual /Global</u>	<u>Degree C</u>
Transmission Line Resistance:	Yes	Individual	
Cable Resistance:	Yes	Individual	

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Bus Input Data

ID	Bus				Initial Voltage	
	Type	Nom. kV	Base kV	Sub-sys	%Mag.	Ang.
Bus3	Load	10.500	10.500	1	100.00	30.00
Bus4	Load	0.380	0.380	1	100.00	0.00
Bus5	Load	10.500	10.500	1	100.00	30.00
Bus6	Load	3.000	3.000	1	100.00	0.00
Bus7	Load	0.380	0.380	1	100.00	0.00
Bus8	Load	10.500	10.500	1	100.00	30.00
Bus9	Load	10.500	10.500	1	100.00	30.00
Bus10	Load	0.380	0.380	1	100.00	0.00
Bus11	Load	10.500	10.500	1	100.00	30.00
Bus12	Load	0.380	0.380	1	100.00	0.00
Bus13	Load	10.500	10.500	1	100.00	30.00
Bus14	Load	3.000	3.000	1	100.00	0.00
Bus21	Load	10.500	10.500	1	100.00	30.00
Bus23	Load	10.500	10.500	1	100.00	30.00
Bus24	Load	10.500	10.500	1	100.00	30.00
Bus25	Load	10.500	10.500	1	100.00	30.00
Bus26	Load	10.500	10.500	1	100.00	30.00
Bus28	SWNG	22.800	22.800	1	100.00	0.00
MCC MBFP	Load	10.000	10.500	1	100.00	30.00
Unit Board A	Load	10.000	10.500	1	100.00	30.00

20 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.

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Line/Cable Input Data

Ohms or Siemens per 1000 m per Conductor (Cable) or per Phase (Line)

Line/Cable	Library	Size	Length		#/Phase	T (°C)	R1	X1	Y1	R0	X0	Y0
			Adj. (m)	% Tol.								
Cable1	15NCUS3	120	169.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	
Cable2	15NCUS3	240	303.0	0.0	1	75	0.09347	0.0952		0.1486172	0.241808	
Cable3	15NCUS3	120	36.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	
Cable4	15NCUS3	120	66.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	
Cable5	15NCUS3	120	159.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	
Cable6	15NCUS3	400	43.0	0.0	1	75	0.0610416	0.0893		0.0970562	0.226822	
Cable7	15NCUS3	150	467.0	0.0	1	75	0.1516502	0.102		0.2411239	0.25908	
Cable8	15NCUS3	120	76.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	
Cable9	10NCUS3	240	104.0	0.0	1	75	0.0941376	0.0853		0.1496759	0.21666	
Cable10	15NCUS3	150	144.0	0.0	1	75	0.1516502	0.102		0.2411239	0.25908	
Cable11	15NCUS3	120	149.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	
Cable12	15NCUS3	120	339.0	0.0	1	75	0.1869399	0.105		0.2972345	0.2667	

Line / Cable resistances are listed at the specified temperatures.

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2-Winding Transformer Input Data

Transformer ID	Rating			Z Variation			% Tap Setting		Adjusted	Phase Shift			
	MVA	Prim. kV	Sec. kV	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
1	0.800	10.500	0.380	5.75	5.79	0	0	0	0	0	5.7500	Dyn	30.000
2	5.000	10.500	3.000	6.50	12.14	0	0	0	0	0	6.5000	Dyn	30.000
3	2.000	10.500	0.380	5.75	7.10	0	0	0	0	0	5.7500	Dyn	30.000
4	1.700	10.500	0.380	5.75	7.10	0	0	0	0	0	5.7500	Dyn	30.000
5	3.000	10.500	0.380	5.75	10.67	0	0	0	0	0	5.7500	Dyn	30.000
6	9.000	10.500	3.000	6.50	15.50	0	0	0	0	0	6.5000	Dyn	30.000
T1	54.000	22.800	10.500	12.50	34.10	0	0	0	0	0	12.5000	Dyn	-30.000

2-Winding Transformer Grounding Input Data

Transformer ID	Rating			Conn. Type	Primary			Secondary					
	MVA	Prim. kV	Sec. kV		Type	kV	Amp	Ohm	Type	kV	Amp	Ohm	
1	0.800	10.500	0.380	D/Y					Solid				
2	5.000	10.500	3.000	D/Y					Solid				
3	2.000	10.500	0.380	D/Y					Solid				
4	1.700	10.500	0.380	D/Y					Solid				
5	3.000	10.500	0.380	D/Y					Solid				
6	9.000	10.500	3.000	D/Y					Solid				
T1	54.000	22.800	10.500	D/Y					Resistor				0.00000

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Branch Connections

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
1	2W XFMR	Bus3	Bus4	118.01	683.26	693.38	
2	2W XFMR	Bus5	Bus6	10.74	130.33	130.77	
3	2W XFMR	Bus8	Bus7	38.69	274.60	277.31	
4	2W XFMR	Bus9	Bus10	45.51	323.05	326.24	
5	2W XFMR	Bus11	Bus12	17.25	184.03	184.84	
6	2W XFMR	Bus13	Bus14	4.68	72.49	72.64	
T1	2W XFMR	Bus28	Unit Board A	0.66	22.49	22.50	
Cable1	Cable	Unit Board A	Bus3	2.87	1.61	3.29	
Cable2	Cable	Unit Board A	Bus5	2.57	2.62	3.67	
Cable3	Cable	Unit Board A	Bus8	0.61	0.34	0.70	
Cable4	Cable	Unit Board A	Bus9	1.12	0.63	1.28	
Cable5	Cable	Unit Board A	Bus11	2.70	1.51	3.09	
Cable6	Cable	Unit Board A	Bus13	0.24	0.35	0.42	
Cable7	Cable	Unit Board A	Bus24	6.42	4.32	7.74	
Cable8	Cable	Unit Board A	Bus25	1.29	0.72	1.48	
Cable9	Cable	Unit Board A	MCC MBFP	0.89	0.80	1.20	
Cable10	Cable	Unit Board A	Bus21	1.98	1.33	2.39	
Cable11	Cable	Unit Board A	Bus23	2.53	1.42	2.90	
Cable12	Cable	Unit Board A	Bus26	5.75	3.23	6.59	

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Synchronous Generator Input Data

Synchronous Generator		Rating				% Impedance in Machine Base					Grounding			Excitation
ID	Type	MVA	kV	RPM	% PF	R	Xd"		R/X	Xd, sat	Conn.	Type	Amp	Type
							Adj.	Tol.						
GENERATOR UNIT 3	Turbo	733.333	22.800	3000	90.00	1.000	19.00	0.0	0.05	155.00	Wye	Solid	0.00	Turbine 130%

Total Connected Synchronous Generators (= 1.00) : 733.333 MVA

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Induction Machine Input Data

Induction Machine			Connected Bus	Rating					PosSeqImp (Mtr Base)			Grounding			mFact.
ID	Type	Qty	ID	HP/kW	kVA	kV	Amp	PF	% R	% X"	R/X"	Conn.	Type	Amp	MW/PP
FORCED DRAFT FAN	Motor	1	Bus21	2980.00	3400.18	10.000	196.31	92.94	1.63	15.30	0.11	Wye	Open		1.49
PRIMARY AIR FAN	Motor	1	Bus23	2110.00	2415.75	10.000	139.47	92.80	1.80	15.28	0.12	Wye	Open		1.06
CIRCULATING WATER PUMP	Motor	1	Bus24	3100.00	3535.59	10.000	204.13	92.96	1.62	15.30	0.11	Wye	Open		1.55
CONDENSATE E. PUMP	Motor	1	Bus25	1500.00	1723.25	10.000	99.49	92.66	1.98	15.26	0.13	Wye	Open		0.75
ID FAN	Motor	1	Bus26	3500.00	3987.11	10.000	230.20	93.01	1.56	15.31	0.10	Wye	Open		1.75
MBFP MOTOR A	Motor	1	MCC MBFP	5600.00	6547.15	10.000	378.00	89.00	1.98	22.07	0.09	Wye	Open		2.80

Total Connected Induction Machines (= 6): 21609.0 kVA

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SHORT- CIRCUIT REPORT

Fault at bus: **MCC MBFP**
 Nominal kV = 10.000
 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 ID	To Bus ID	% V From Bus	kA Symm. rms	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
				Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
MCC MBFP	Total	0.00	29.729	0.00	173.21	173.21	0.000	0.000	1.76E+000	1.93E+001		
Unit Board A	MCC MBFP	5.79	27.853	0.00	173.21	173.21	0.000	0.000	1.88E+000	2.06E+001		
MBFP MOTOR A	MCC MBFP	100.00	1.877	0.00	173.21	173.21	0.000	0.000	2.74E+001	3.06E+002		

	3-Phase	L-G	L-L	L-L-G
Initial Symmetrical Current (kA, rms) :	29.729	0.000	26.122	26.122
Peak Current (kA), Method C :	74.324	0.000	65.305	65.305
Breaking Current (kA, rms, symm) :		0.000	26.122	26.122
Steady State Current (kA, rms) :	22.169	0.000	26.122	26.122

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

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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	I _k	I ^{"k}	ip	I _b	I _k	I ^{"k}	ip	I _b	I _k	I ^{"k}	ip	I _b	I _k
MCC MBFP	10.000	29.729	74.324	22.169	0.000	0.000	0.000	0.000	26.122	65.305	26.122	26.122	26.122	65.305	26.122	26.122

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.

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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
MCC MBFP	10.000	0.01941	0.21274	0.21362	0.02032	0.20648	0.20748				0.00000	0.00000	0.00000

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Sequence-of-Operation Event Summary Report

Symmetrical 3-Phase Fault between MCC MBFP and MBFP MOTOR A. Adjacent to MCC MBFP.

Time (ms)	ID	If (kA)	T1 (ms)	T2 (ms)	Condition
0.0	Relay2	24.905	0.0		Phase - OC1 - 50
10.0	CB18		10.0		Tripped by Relay2 Phase - OC1 - 50
1165	Relay4	19.519	1165		Phase - OC1 - 51
1175	CB28		10.0		Tripped by Relay4 Phase - OC1 - 51
1175	CB29		10.0		Tripped by Relay4 Phase - OC1 - 51