


## LAMPIRAN

### 1. Data Sheet Main Transformer



# TRANSFORMER

RATED CAPACITY  MVA

FREQUENCY  Hz

PHASE

RATED VOLTAGES  
 PRIMARY  kV  
 SECONDARY  kV

IMPEDANCE VOLTAGE

STANDARD

TEMPERATURE RISE  °C

TYPE OF COOLING

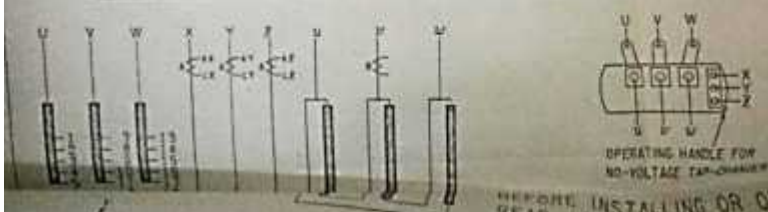
MANUFACTURE'S SERIAL NO.

OUTDOOR USE

TERMINALS	INSULATION CLASS	INSULATION LEVEL (BIL)
U V W	120	650
x y z	20A	200
g v m	20A	150

BCT	RATED CURRENT (A)	RATED BURDEN (VA)	ACCURACY CLASS	OVERCURRENT CONSTANT
A	300015	40	1.0	200
B	924012	FOR USE WITH NO. TAP INDICATOR		

TERMINALS	VOLTAGES (kV)	CURRENTS (A)	TAP POS.	NO-VOLTAGE TAP-CHANGER CONNECTIONS
U V W	F151.20	657	1	5-6 11-12 17-18
	F157.85	678	2	4-6 10-12 16-18
	F154.00	900	3	3-6 9-12 15-18
	F150.15	923	4	2-6 8-12 14-18
	F146.30	947	5	1-6 7-12 13-18
g v m	15.00	9240		



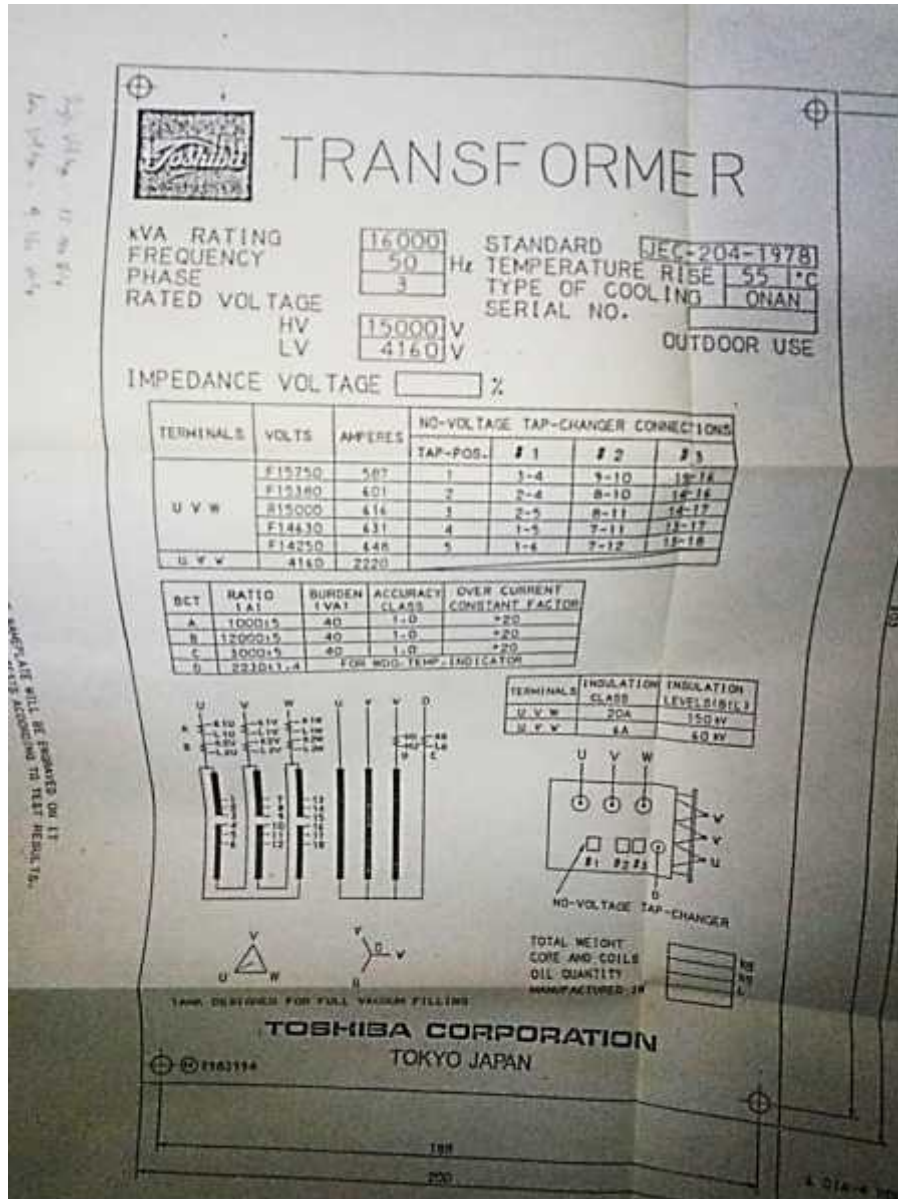
BEFORE INSTALLING OR OPERATING  
 READ INSTRUCTIONS  
 CORE AND COILS  
 MAIN TANK OIL  
 CABLE JUNCTION BOX OIL  
 TOTAL WEIGHT  
 MANUFACTURED IN

## TOSHIBA CORPORATION

23529797 TOKYO JAPAN

E-3583209

2. Data Sheet Main Transformer



### 3. Data Setting Main Transformer

Multi-Function Relay Editor - Relay15

Info Input Output **OCR** DIF TCC kA Model Info Checker Remarks Comment

GE Multilin T60

OC Level  
OC1  Enabled  Integrated Curves   
 Link TOC + IOC for this level

Phase Neutral Ground

Overcurrent

Curve Type IEC - Curve C

Pickup Range 0.01 - 30 xCT Sec Multiples

Pickup 0.8 Step: 0.001

Relay Amps 4 1200 Prim. Amps

Time Dial 0.08 Step: 0.01

### 4. Data Setting Auxiliary Transformer

Multi-Function Relay Editor - Relay14

Info Input Output **OCR** DIF TCC kA Model Info Checker Remarks Comment

GE Multilin T35

OC Level  
OC1  Enabled  Integrated Curves

Phase Ground

Overcurrent

Curve Type IEEE - Moderately Inverse

Pickup Range 0 - 30 xCT Sec Multiples

Pickup 0.8 Step: 0.001

Relay Amps 4 800 Prim. Amps

Time Dial 0.2 Step: 0.01

## 5. Data Setting Motor Boiler Feed Pump

Thermal Acceleration Instantaneous Jam Ground

Thermal

Type Standard Overload Curve

Trip Range 1.01 - 1.25 xFLA Multiples

Trip 1.23 Step: 0.01

Trip Amps 3.997 Prim. Amps 599.625

Curve Multiplier 4.188 Step: 1

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Thermal Acceleration Instantaneous Jam Ground

Instantaneous

Trip Range 2 - 20 xCT Pri Multiples

Trip 6.6 Step: 0.1

Trip Amps 33 Prim. Amps 4950

Delay (sec) 0.02 Step: 0.01

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Thermal Acceleration Instantaneous Jam Ground

Acceleration

Type Start Up Curve

Trip Range 1 - 1 x49 Pickup Multiples

Trip 1

Trip Amps 3.997 Prim. Amps 599.625

Acceleration Time 6 Step: 0.1

## 6. Data Setting Motor *Forced Draft Fan*

Thermal Acceleration Instantaneous Jam Ground

Thermal

Type: Standard Overload Curve

Trip Range: 1.01 - 1.25 xFLA Multiples

Trip: 1.02 Step: 0.01

Trip Amps: 3.466 Prim. Amps: 207.978

Curve Multiplier: 2.8 Step: 1

Thermal Acceleration Instantaneous Jam Ground

Instantaneous

Trip Range: 2 - 20 xCT Pri Multiples

Trip: 7.2 Step: 0.1

Trip Amps: 36 Prim. Amps: 2160

Delay (sec): 0.02 Step: 0.01

Thermal Acceleration Instantaneous Jam Ground

Acceleration

Type: Start Up Curve

Trip Range: 1 - 1 x49 Pickup Multiples

Trip: 1

Trip Amps: 3.466 Prim. Amps: 207.978

Acceleration Time: 3 Step: 0.1

## 7. Data Setting Motor Circulating Water Pump

Thermal Acceleration Instantaneous Jam Ground

Thermal

Type: Standard Overload Curve

Trip Range: 1.01 - 1.25 xFLA Multiples

Trip: 1.21 Step: 0.01

Trip Amps: 4,483 Prim. Amps: 89,661

Curve Multiplier: 2 Step: 1

Thermal Acceleration Instantaneous Jam Ground

Acceleration

Type: Start Up Curve

Trip Range: 1 - 1 x49 Pickup Multiples

Trip: 1

Trip Amps: 4,483 Prim. Amps: 89,661

Acceleration Time: 2 Step: 0.1

Thermal Acceleration Instantaneous Jam Ground

Instantaneous

Trip Range: 2 - 20 xCT Pri Multiples

Trip: 8.2 Step: 0.1

Trip Amps: 41 Prim. Amps: 820

Delay (sec): 0.02 Step: 0.01

## 8. Data Setting Motor Condensate Pump

Thermal Acceleration Instantaneous Jam Ground

Thermal

Type Standard Overload Curve

Trip Range 1.01 - 1.25 xFLA Multiples

Trip 1.2 Step: 0.01

Trip Amps 3.798 Prim. Amps 75.96

Curve Multiplier 3.08 Step: 1

Thermal Acceleration Instantaneous Jam Ground

Acceleration

Type Start Up Curve

Trip Range 1 - 1 x49 Pickup Multiples

Trip 1

Trip Amps 3.798 Prim. Amps 75.96

Acceleration Time 3 Step: 0.1

Thermal Acceleration Instantaneous Jam Ground

Instantaneous

Trip Range 2 - 20 xCT-Pri Multiples

Trip 6.6 Step: 0.1

Trip Amps 33 Prim. Amps 660

Delay (sec) 0.02 Step: 0.01

## 9. Data Setting Motor Auxiliary Oil Pump

Thermal Acceleration Instantaneous Jam Ground

Thermal

Type Standard Overload Curve

Trip Range 1.01 - 1.25 xFLA Multiples

Trip 1.23 Step: 0.01

Trip Amps 2.952 Prim. Amps 44.28

Curve Multiplier 2.8 Step: 1

Thermal Acceleration Instantaneous Jam Ground

Instantaneous

Trip Range 2 - 20 xCT Pri Multiples

Trip 6.4 Step: 0.1

Trip Amps 32 Prim. Amps 480

Delay (sec) 0.02 Step: 0.01



## 10. Data Setting Motor Spare for (Motor)

Thermal Acceleration Instantaneous Jam Ground

Thermal

Type Standard Overload Curve

Trip Range 1.01 - 1.25 xFLA Multiples

Trip 1.25 Step: 0.01

Trip Amps 4.063 Prim. Amps 609.375

Curve Multiplier 2.8 Step: 1

Thermal Acceleration Instantaneous Jam Ground

Acceleration

Type Start Up Curve

Trip Range 1 - 1 x49 Pickup Multiples

Trip 1

Trip Amps 4.063 Prim. Amps 609.375

Acceleration Time 4 Step: 0.1

Thermal Acceleration Instantaneous Jam Ground

Instantaneous

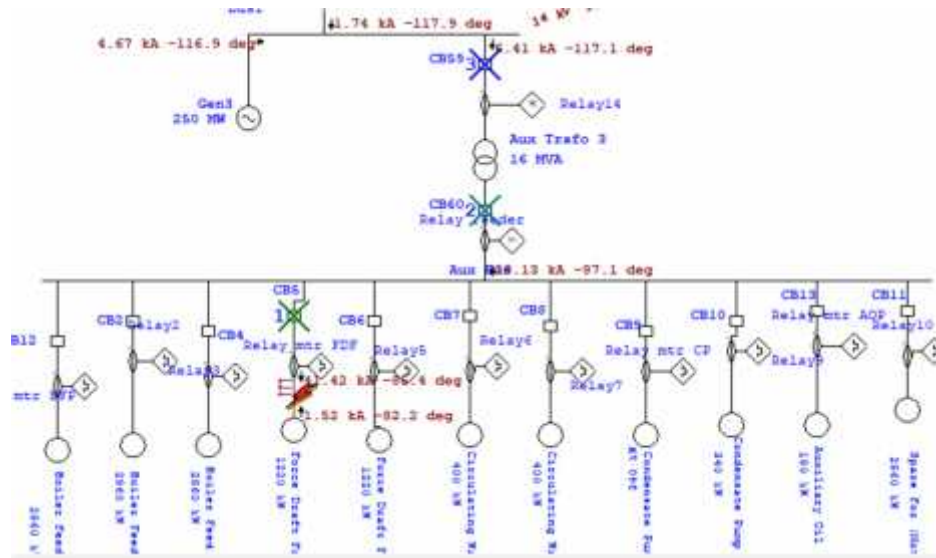
Trip Range 2 - 20 xCT Pri Multiples

Trip 6.7 Step: 0.1

Trip Amps 33.5 Prim. Amps 5025

Delay (sec) 0.02 Step: 0.01

## 11. Simulasi Gangguan pada Daerah *Forced Draft Fan* dan Waktu Kerja Relay



Sequence-of-Operation Events - Output Report: Untitled

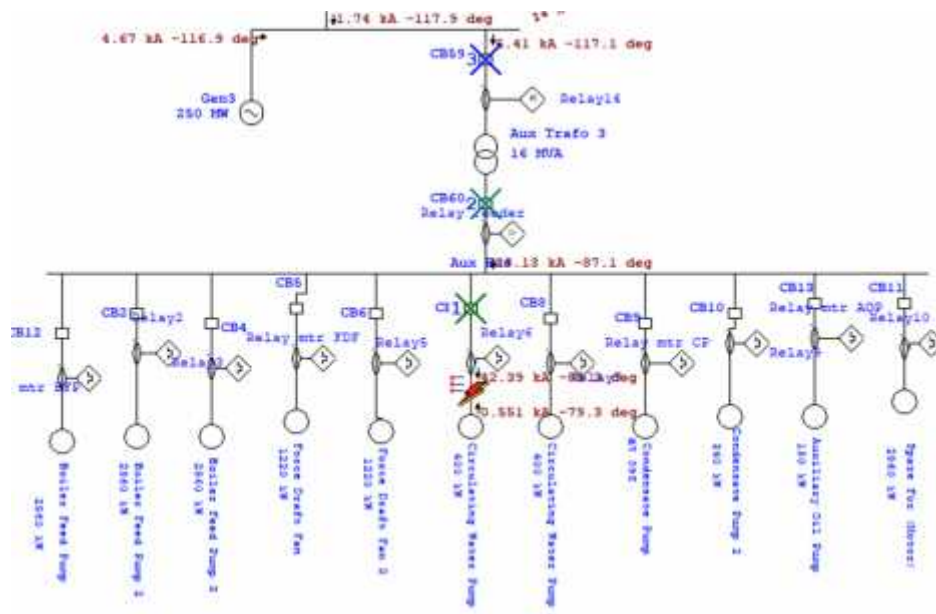
3Phase (Symmetrical) fault on connector between CT5 & Force Draft Fan. Adjacent bus: Aux Bus

Data Rev.: Base      Config: Normal      Date: 05-02-2018

Time (ms)	ID	If (kA)	T1 (ms)	T2 (ms)	Condition
20.0	Relay mtr FDF	41.425	20.0		Overload Phase - Instantaneous
30.0	CB5		10.0		Tripped by Relay mtr FDF Overload Phase - Insta...
220	Relay Feeder	23.131	220		Phase - OC1 - 50
230	CB60		10.0		Tripped by Relay Feeder Phase - OC1 - 50
265	Relay14	6.415	265		Phase - OC1 - 51
275	CB59		10.0		Tripped by Relay14 Phase - OC1 - 51
2000	Relay6	0.551	2000		Overload Acceleration - Accel
2000	Relay7	0.551	2000		Overload Acceleration - Accel
2010	CB7		10.0		Tripped by Relay6 Overload Acceleration - Accel
2010	CB8		10.0		Tripped by Relay7 Overload Acceleration - Accel
3000	Relay mtr CP	0.47	3000		Overload Acceleration - Accel
3000	Relay mtr FDF	41.425	3000		Overload Acceleration - Accel
3000	Relay5	1.516	3000		Overload Acceleration - Accel
3000	Relay9	0.47	3000		Overload Acceleration - Accel
3010	CB5		10.0		Tripped by Relay mtr FDF Overload Acceleration - ...
3010	CB6		10.0		Tripped by Relay mtr FDF Overload Acceleration - Accel

## 12. Simulasi Gangguan pada Daerah *Circulating Water Pump* dan Waktu Kerja Relay

### Relay



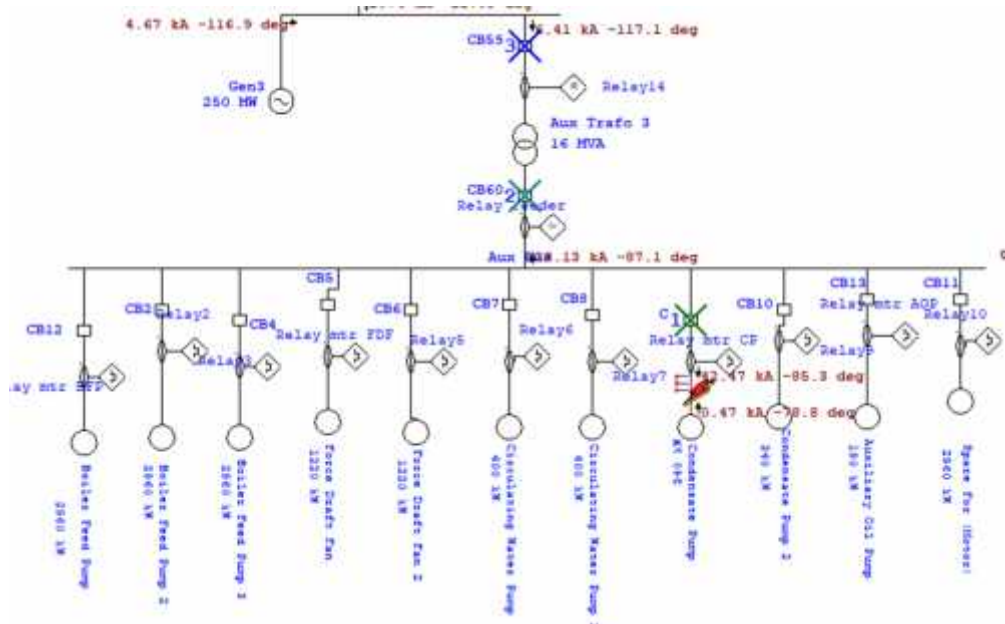
Sequence-of-Operation Events - Output Report: Untitled

3-Phase (Symmetrical) fault on connector between CT7 & Circulating Water Pump. Adjacent bus: Aux Bus

Data Rev.: Base      Config: Normal      Date: 05-02-2018

Time (ms)	ID	If (kA)	T1 (ms)	T2 (ms)	Condition
20.0	Relay6	42.391	20.0		Overload Phase - Instantaneous
30.0	CB7		10.0		Tripped by Relay6 Overload Phase - Instantaneous
220	Relay Feeder	23.131	220		Phase - OC1 - 50
230	CB60		10.0		Tripped by Relay Feeder Phase - OC1 - 50
265	Relay14	6.415	265		Phase - OC1 - 51
275	CB59		10.0		Tripped by Relay14 Phase - OC1 - 51
2000	Relay6	42.391	2000		Overload Acceleration - Accel
2000	Relay7	0.551	2000		Overload Acceleration - Accel
2010	CB7		10.0		Tripped by Relay6 Overload Acceleration - Accel
2010	CB8		10.0		Tripped by Relay7 Overload Acceleration - Accel
3000	Relay mtr CP	0.47	3000		Overload Acceleration - Accel
3000	Relay mtr FDF	1.516	3000		Overload Acceleration - Accel
3000	Relay5	1.516	3000		Overload Acceleration - Accel
3000	Relay9	0.47	3000		Overload Acceleration - Accel
3010	CB5		10.0		Tripped by Relay mtr FDF Overload Acceleration ...
3010	CB6		10.0		Tripped by Relay5 Overload Acceleration - Accel

### 13. Simulasi Gangguan pada Daerah *Condensate Pump* dan Waktu Kerja Relay



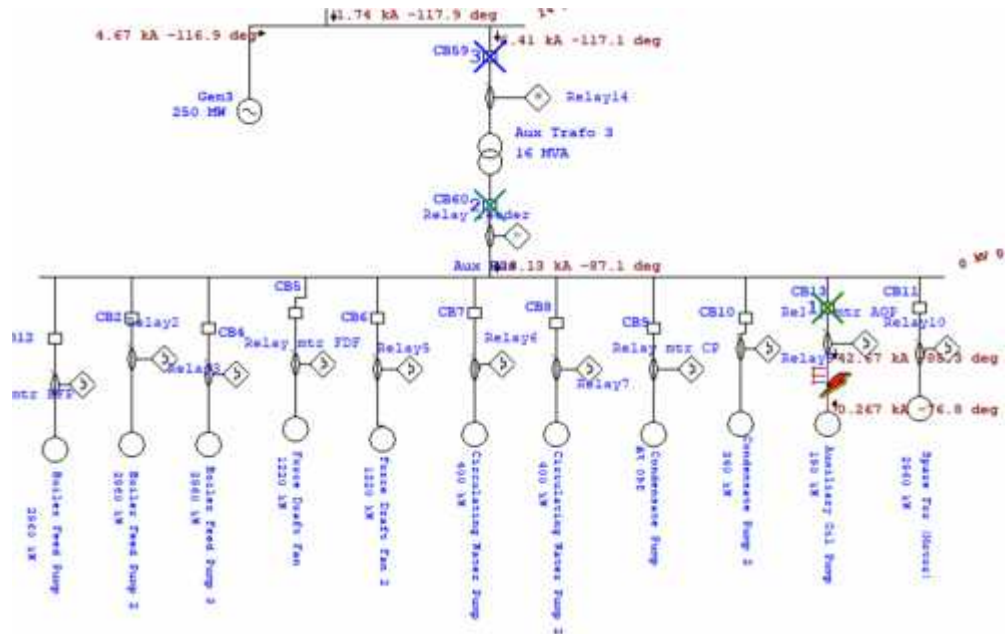
Sequence-of-Operation Events - Output Report: Untitled

3-Phase (Symmetrical) fault on connector between CT9 & Condensate Pump. Adjacent bus: Aux Bus

Data Rev.: Base      Config: Normal      Date: 05-02-2018

Time (ms)	ID	If (kA)	T1 (ms)	T2 (ms)	Condition
20.0	Relay mtr CP	42.471	20.0		Overload Phase - Instantaneous
30.0	CB9		10.0		Tripped by Relay mtr CP Overload Phase - Instant...
220	Relay Feeder	23.131	220		Phase - OC1 - 50
230	CB60		10.0		Tripped by Relay Feeder Phase - OC1 - 50
265	Relay14	6.415	265		Phase - OC1 - 51
275	CB59		10.0		Tripped by Relay14 Phase - OC1 - 51
2000	Relay6	0.551	2000		Overload Acceleration - Accel
2000	Relay7	0.551	2000		Overload Acceleration - Accel
2010	CB7		10.0		Tripped by Relay6 Overload Acceleration - Accel
2010	CB8		10.0		Tripped by Relay7 Overload Acceleration - Accel
3000	Relay mtr CP	42.471	3000		Overload Acceleration - Accel
3000	Relay mtr FDF	1.516	3000		Overload Acceleration - Accel
3000	Relay5	1.516	3000		Overload Acceleration - Accel
3000	Relay9	0.47	3000		Overload Acceleration - Accel
3010	CB5		10.0		Tripped by Relay mtr FDF Overload Acceleration ...
3010	CC		10.0		Tripped by Relay5 Overload Acceleration - Accel

#### 14. Simulasi Gangguan pada Daerah Auxiliary Oil Pump dan Waktu Kerja Relay



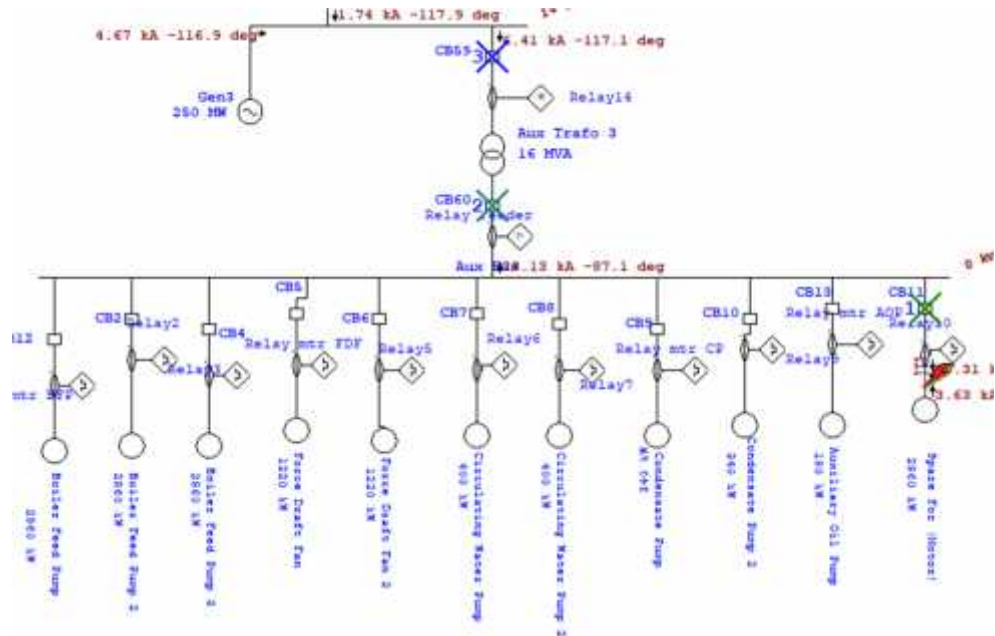
Sequence-of-Operation Events - Output Report: Untitled

3-Phase (Symmetrical) fault on connector between CT13 & Auxiliary Oil Pump. Adjacent bus: Aux Bus

Data Rev.: Base      Config: Normal      Date: 05-02-2018

Time (ms)	ID	If (kA)	T1 (ms)	T2 (ms)	Condition
20.0	Relay mtr A...	42.674	20.0		Overload Phase - Instantaneous
30.0	CB13		10.0		Tripped by Relay mtr AQP Overload Phase - Insta...
220	Relay Feeder	23.131	220		Phase - OC1 - 50
230	CB60		10.0		Tripped by Relay Feeder Phase - OC1 - 50
265	Relay14	6.415	265		Phase - OC1 - 51
275	CB59		10.0		Tripped by Relay14 Phase - OC1 - 51
2000	Relay6	0.551	2000		Overload Acceleration - Accel
2000	Relay7	0.551	2000		Overload Acceleration - Accel
2010	CB7		10.0		Tripped by Relay6 Overload Acceleration - Accel
2010	CB8		10.0		Tripped by Relay7 Overload Acceleration - Accel
3000	Relay mtr CP	0.47	3000		Overload Acceleration - Accel
3000	Relay mtr FDF	1.516	3000		Overload Acceleration - Accel
3000	Relay5	1.516	3000		Overload Acceleration - Accel
3000	Relay9	0.47	3000		Overload Acceleration - Accel
3010	CB5		10.0		Tripped by Relay mtr FDF Overload Acceleration - ...
3010	CB6		10.0		Tripped by Relay5 Overload Acceleration - Accel

### 15. Simulasi Gangguan pada Daerah Spare for (Motor) dan Waktu Kerja Relay



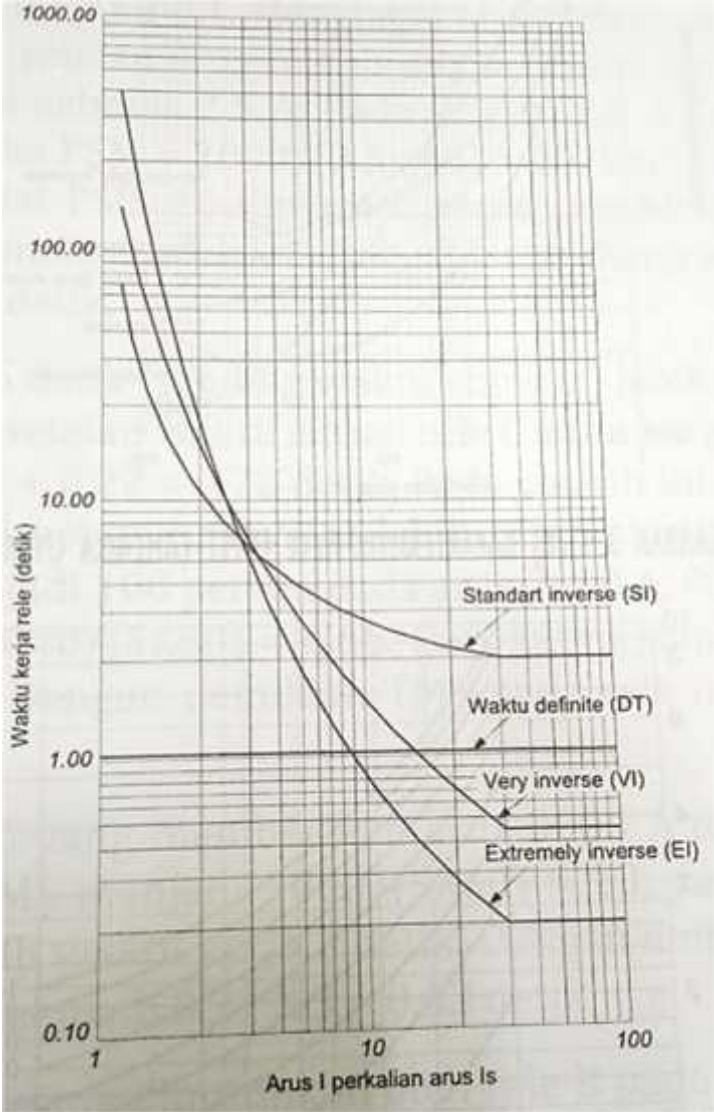
Sequence-of-Operation Events - Output Report: Untitled

3-Phase (Symmetrical) fault on connector between CT11 & Spare For (Motor). Adjacent bus: Aux Bus

Data Rev.: Base      Config: Normal      Date: 05-02-2018

Time (ms)	ID	If (kA)	T1 (ms)	T2 (ms)	Condition
20.0	Relay10	39.314	20.0		Overload Phase - Instantaneous
30.0	CB11		10.0		Tripped by Relay10 Overload Phase - Instantane...
220	Relay Feeder	23.131	220		Phase - OC1 - 50
230	CB60		10.0		Tripped by Relay Feeder Phase - OC1 - 50
265	Relay14	6.415	265		Phase - OC1 - 51
275	CB59		10.0		Tripped by Relay14 Phase - OC1 - 51
2000	Relay6	0.551	2000		Overload Acceleration - Accel
2000	Relay7	0.551	2000		Overload Acceleration - Accel
2010	CB7		10.0		Tripped by Relay6 Overload Acceleration - Accel
2010	CB8		10.0		Tripped by Relay7 Overload Acceleration - Accel
3000	Relay mtr CP	0.47	3000		Overload Acceleration - Accel
3000	Relay mtr FDF	1.516	3000		Overload Acceleration - Accel
3000	Relay5	1.516	3000		Overload Acceleration - Accel
3000	Relay9	0.47	3000		Overload Acceleration - Accel
3010	CB5		10.0		Tripped by Relay mtr FDF Overload Acceleration ...
3010	CB6		10.0		Tripped by Relay5 Overload Acceleration - Accel

16. Karakteristik Kurva Relay Arus Lebih



17. Overload Motor Curve

