Summary Format
(Substation Wise)

Division: **Substation**

Sl. No. (A)	Format	Equipment	No. of Equipment Installed/in use	No. of formats used
1.	QF-RTS-01	Summary format		
2.	QF-RTS-02	Power Transformer (Nameplate)		
3.	QF-RTS-03	Transformer Oil Test Report		
4.	QF-RTS-04	Circuit Breaker (Nameplate)		
5.	QF-RTS-05	Disconnecting Switch (Nameplate)		
6.	QF-RTS-06	Voltage Transformer (Nameplate)		
7.	QF-RTS-07	Current Transformer (Nameplate)		
8.	QF-RTS-08	Lightning Arrester (Nameplate)		
9.	QF-RTS-09	Battery/Battery Charger (Nameplate)		
10.	QF-RTS-10	Equipment Maintenance history		
11.	QF-RTS-11	Transformer Tan-delta (3 phase)		
12.	QF-RTS-12	Transformer Tan-delta (single phase)		
13.	QF-RTS-13	Instrument Transformer Tan-delta		
14.	QF-RTS-14	Circuit Breaker Timing Test		
15.	QF-RTS-15	Circuit Breaker Contact Resistance Test		
16.	QF-RTS-16	Battery Load Test		

B	Single Line Diagram	

Comment/Other Information (if any):

AE/SDE
_____ Substation.

Executive Engineer,
_____ GMD .

Reviewed by CE (T-1)

Approved by ED (O&M)

Transformer Data of Grid Substation

GC :		GMD :	
SUBSTATION:		STATUS :	

MVA & Current Rating

Manufacturer	:				Trans. ID	:		
BAY ID	:		Manufac. Year	:		Frequency	:	50 Hz
Serial No.	:		No. of Phase	:		Wdg. Type	:	
Standard	:							

Voltage Level

Voltage Level In KV	HV	LV	TV (If
	134	37	

Note

Note	:	

MVA & Current Rating

Sl. No.	Rating		ONAN	ONAF	FAF
1.	HV/LV	MVA Rating (HT/LT)	50	75	
2.		Ampere Rating (HT/LT)	215.4	323.1	
3.	TV	MVA Rating (HT/LT)			
4.		Ampere Rating (HT/LT)			

Tap Changer

	Manufacturer		Type of Tap Changer	No. of Taps	Nominal Tap No.
Tap Changer		HV	On Load		
		LV	Changer Type		
	Motor Power	:		Driving Type :	MOTOR

Impedance

Sl. No.	% Z (HV-LV) & XR Ratio		Nominal Tap	Last Tap
1.	% Z (HV-LV)			
2.	XR Ratio			

BIL (Basic Insulation Level) :

Insulation Level	LIWL	SIWL	PFWL

Neutral Grounding

Neutral Grounding	Impedance Ω

Temparature Rise : **Vector Group** **Winding Resistance :**

Oil Temperature Rise		DC full winding resistance in Ω	HV	LV	TV (If any)
°C					

Bushing Information :

Bushing Information	Bushing Manufacturer	Year of Manufacturing	Bushing Type	Capacitance		Tan δ

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M)

Quality Management System	POWER GRID COMPANY OF BANGLADESH LTD. TITLE: Transformer Insulating Oil Test Report					QUALITY FORMS			
Document No.	QF-RTS-03	Revision No.:	01	Effective Date:		Page	1	of	1

Name of Sub-Station		Capacity & Voltage Level			
Sample Identity				Date of Sample Collection	
Manufacturer Name		Year of Manufacturer		Year of Commissioning	
Winding Temp.		Oil Temp.		Ambient Temp.	

Name of Test: Dissolved Gas Analysis (DGA)

Dissolved Gases	IEEE C57.104 Limits (ppm) (Con-2)	Test Result (ppm)					Test Instrument
		Date-1	Date-2	Date-3	Date-4	Date-5	
Hydrogen (H_2)	700						
Carbon Di Oxide (CO_2)	570						
Carbon Monoxide (CO)	4000						
Methane (CH_4)	400						
Ethane (C_2H_6)	100						
Ethylene (C_2H_4)	100						
Acetylene (C_2H_2)	9						
TDCG	1920						

Name of Test: Moisture Content

IEC 60422 Limit ppm (mg/kg)		Test Result (ppm @20°C)					Test Instrument
New Oil	Old Oil	Date-1	Date-2	Date-3	Date-4	Date-5	
<10	<20						

Name of Test: Di-electric Dissipation Factor (TAN-δ)

IEEE C57.106 (Limit@25°C)	Applied voltage	Test Result										Test Instrument
		Date-1		Date-2		Date-3		Date-4		Date-5		
		Cp(pf)	Tan-δ (%)	Cp(pf)	Tan-δ (%)	Cp(pf)	Tan-δ (%)	Cp(pf)	Tan-δ (%)	Cp(pf)	Tan-δ (%)	
New Oil 0.05% Old Oil 0.5%	2 KV											
	3 KV											
	5 KV											

Name of Test: Acidity (Neutralization Number)

IEC 60422 Limit (mg KOH/g)			Test Result (mg KOH/g)					Test Instrument
Good	Fair	Poor	Date-1	Date-2	Date-3	Date-4	Date-5	
<0.1	0.1-0.2	>0.2						

Recommendation:

☐ Result Satisfactory. ☐ Need observation. Resampling after ….. Month. ☐ Caution. Resampling immediately.

Comments:

Tested By:	Witnessed By:	Verified By:	C/S By:
Assistant/ Sub-Assistant Engineer,	Sub-Divisional/Assistant Engineer	Executive Engineer	Superintending Engineer

Reviewed by CE (T-1)

Approved by ED (O&M)

CIRCUIT BREAKER

EQUIPMENT DATA OF GRID SUBSTATION

GC :		GMD :	
SUBSTATION:			

NAME OF MANUFACTURER:	:				
YEAR OF MANUFACTURER:	:		TYPE OF BREAKER :		
BREAKER ID	:				
BAY ID	:				
SERIAL NO.	:		RATED FREQUENCY :		
OPERATION	:		RATED SHORT CIRCUIT BREAKING :		
RATED SHORT TIME CURRENT	:		OPERATING MECHANISM VOLTAGE :		
RATED MAKING CURRENT	:		OPERATING SEQUENCE :		
OPERATING MECHANISM :			CONTROL VOLTAGE :		
RATED CURRENT :	:		TANKTYPE :		
GAS PRESURE	:		RATED VOLTAGE :		
NOTE	:				

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M)

EQUIPMENT DATA OF GRID SUBSTATION

DISCONNECTING SWITCH / ISOLATOR

GC :		**GMD :**	
SUBSTATION:		Running	

MANUFACTURER :		DS ID. :	
TYPE :		BAY ID :	
SERIAL NO. :		YEAR OF MANUFACTURER:	
RATED VOLTAGE :	KV :	STANDARD :	
RATED CURRENT :	A :	RATED FREQUENCY :	Hz :
SHORT TIME CURRENT :	KA : SEC	NO. OF POLE :	
NO. OF CONTACTS :	NO :	TYPE OF BREAKING :	KV :
	NC	OPERATING MECHANISM :	V :
OPERATING VOLTEGE :	V DC :		

NOTE :

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M)

VOLTAGE TRANSFORMER

EQUIPMENT DATA OF GRID SUBSTATION

GC :		GMD :	
SUBSTATION :			
MANUFACTURER :		VT. ID. :	

BAY ID :

TYPE :

RATED VOLTAGE PRIMARY : KA

MANUFAC YEAR:

STANDARD

RATED VOLTAGE SECONDARY :

RATED FREQUENCY : Hz

RATED CAPACITANCE :

NO. OF PHASE :

SHORT TIME CURRENT : KA SEC

TERMINALS MARKING :

TOTAL WEIGHT KG

WEIGHT OF OIL :

STATUS

SL. NO. :

Note :

SPECIFICATION

Sl.No.	Ratio	Sec. Connection	Aux. Connection	Burden (VA)	Accuracy Class
1					

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M

EQUIPMENT DATA OF GRID SUBSTATION

CURRENT TRANSFORMER

GC :		GMD :	
SUBSTATION:			

NAMER OF MANUFACTURER :			CT. ID. :		
YEAR OF MANUFACTURE :			BAY ID.		
TYPE			SL. NO. :		
RATED PRIMARY VOLTAGE :		KV	RATED FREQUENCY :		
RATED PRIMARY CURRENT :		A	NO. OF PHASE :		HZ
RATED SECONDARY CURRENT :		A	TERMINALS MARKING :		
RATED BURDEN :		VA	CLASS		
MEASURED		VA	WEIGHT OF OIL :		Kg
NO. OF SEC. WINDING :		NO	STATUS		
TOTAL WEIGHT		Kg	STANDARD		

Note :

Detail Specification

Sl.No.	Ratio	Sec. Connection	Aux. Connection	Burden VA	Accuracy Class
1					

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M)

EQUIPMENT DATA OF GRID SUBSTATION

SURGE / LIGHTNING ARRESTER

GC :		GMD :	
SUBSTATION:			QF-RTS-08

NAME OF MANUFACTURER:

CT. ID. :

TYPE :

BAY ID :

RATED SYSTEM VOLTAGE : KV

YEAR OF MANUFACTURER:

RATED OPERATING VOLTAGE : KV

STANDARD :

ENERGY INPUT : KJ/KV

RATED FREQUENCY : Hz

TOTAL WEIGHT : KG

NOMINAL DISCHARGE CURRENT KA

EQUIPMENT STATUS :

PROTECTIVE CLASS :

SL. NO. :

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M)

BATTERY & BATTERY CHARGER EQUIPMENT DATA OF GRID SUBSTATION

GC :		GMD :	
SUBSTATION:			Running

NAME OF MANUFACTURER	:				
YEAR OF MANUFACTURER	:		VOLUME OF ELECTROLYTE :		Lit.
Battery ID	:				
Bay ID	:		SERIAL No. :		
MANUFACTURER TYPE	:		CAPACITY :		AH
TYPE OF ELECTROLYTE	:		VOLTAGE PER CELL (NOMINAL) :		V DC
FLOAT CHARGE RATE	:		MAXIMUM BOOST CHARGE RATE :		MA
EFFICIENCY AT 10 HOUR	:		RATED SHORT TIME CURRENT :		KA
NOTE	:				

BATTERY CHARGER

NAME OF MANUFACTURER						
YEAR OF MANUFACTURE			MANUFACTURER TYPE :			
RECTIFICATION SYSTEM			FREQUENCY :			Hz
CONTROLLING SYSTEM			CHARGING MODE :			
AC SIDE	INPUT		DC SIDE	OUTPUT :		V
	RATED VOLTEGE			CURRENT :		A
CHARGING CONTROL						
NOTE						

AE/SDE,
_____Sub-station.

Reviewed by CE (T-1)

Approved by ED (O&M)

Power Grid Company of Bangladesh Ltd.

EQUIPMENT MAINTENANCE HISTORY

DIVISION: _____ SUBSTATION: _____

1. Installation / commissioning date : _____
2. Name of project / agency under which equipment installed : _____
3. Equipment manual / brochure available : Yes/ No _____
4. Final drawing available Ye/ No _____
5. Major Problems / Fault occurred :

Date	Type of Problem / Fault	Action taken	Present status / Remarks

6. Other information's (if any) :

AE/SDE
_____ Substation.

Executive Engineer,
_____ GMD

Reviewed by CE (T-1)

Approved by ED (O&M)

Power Transformer (Three Phase) Tan-δ Test

Substation Name:	Date:

Equipment ID:	Test Equipment:
Capacity:	Equipment Serial:
Voltage Rating:	Reference Value:
Manufacturer:	Ambient Temp. :
Year of Manufacturing:	Oil Temp. :
Test Frequency :	Humidity :

Transformer Tan-delta

Mode		UST-A		GSTg-A+B		GSTg-B		GSTg-A+B		GSTg-B	
Measurement		C_{HL} (HV-LV)		C_H (HV-G)		$C_{HL}+C_H$ (Check)		C_L (LV-G)		$C_{HL}+C_L$ (Check)	
Sl No	Voltage (kV)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)
1	5										
2	10										

Bushing Tan-delta

Measurement		HT		LT		Tertiary		Neutral	
Phase	Mode	UST-A (Test Terminal)		UST-A (Test Terminal)		UST-A (Test Terminal)		UST-A (Test Terminal)	
	Voltage (kV)	Cp (pF)	DF (%)	Cp (pF)	DF (%)	Cp (pF)	DF (%)	Cp (pF)	DF (%)
R	5								
	10								
Y	5								
	10								
B	5								
	10								

Recommendation:

Transformer

- ☐ Result satisfactory.
- ☐ Need Observation. Retest after ___ month.
- ☐ Centrifuge the oil.

Bushing

- ☐ Result satisfactory.
- ☐ Need Observation. Retest after ___ month.
- ☐ Replace the _____ phase bushing immediately.

Comment :

Tested By	Witnessed/Checked By	Counter signed By
AE/SDE, RTS,PGCB	Executive Engineer, RTS, PGCB	Superintending Engineer, RTS, PGCB

Reviewed by CE (T-1)

Approved by ED (O&M)

Power Transformer (Single Phase) Tan-δ Test

Substation Name:	Date:

Equipment ID:	Test Equipment:
Capacity:	Equipment Serial:
Voltage Rating:	Reference Value:
Manufacturer:	Ambient Temp. :
Year of Manufacturing:	Oil Temp. :
Test Frequency:	Humidity :

Transformer R Phase

Mode		UST-A		GSTg-A+B		GSTg-B		GSTg-A+B		GSTg-B	
Measurement		C_{HL} (HV-LV)		C_H (HV-G)		$C_{HL}+C_H$ (Check)		C_L (LV-G)		$C_{HL}+C_L$ (Check)	
Sl No	Voltage(kV)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)
1	5										
2	10										

Transformer Y Phase

Mode		UST-A		GSTg-A+B		GSTg-B		GSTg-A+B		GSTg-B	
Measurement		C_{HL} (HV-LV)		C_H (HV-G)		$C_{HL}+C_H$ (Check)		C_L (LV-G)		$C_{HL}+C_L$ (Check)	
Sl No	Voltage(kV)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)
1	5										
2	10										

Transformer B Phase

Mode		UST-A		GSTg-A+B		GSTg-B		GSTg-A+B		GSTg-B	
Measurement		C_{HL} (HV-LV)		C_H (HV-G)		$C_{HL}+C_H$ (Check)		C_L (LV-G)		$C_{HL}+C_L$ (Check)	
Sl No	Voltage(kV)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)	Cp (nF)	DF (%)
1	5										
2	10										

Bushing

Measurement		HT		LT		Tertiary		Neutral	
Phase	Mode	UST-A (Test Terminal)		UST-A (Test Terminal)		UST-A (Test Terminal)		UST-A (Test Terminal)	
	Voltage (kV)	Cp (pF)	DF (%)	Cp (pF)	DF (%)	Cp (pF)	DF (%)	Cp (pF)	DF (%)
R	5								
	10								
Y	5								
	10								
B	5								
	10								

Recommendation:

Transformer

- ☐ Result satisfactory.
- ☐ Need Observation. Retest after ___ month.
- ☐ Centrifuge the oil.

Bushing

- ☐ Result satisfactory.
- ☐ Need Observation. Retest after ___ month.
- ☐ Replace the _____ phase bushing immediately.

Comment :

Tested By	Witnessed/Checked By	Counter signed By
AE/SDE, RTS, PGCB	Executive Engineer, RTS, PGCB	Superintending Engineer, RTS, PGCB

Reviewed by CE (T-1)

Approved by ED (O&M)

TAN-δ Test Result of Current Transformer / Voltage Transformer

Test Instrument Used :
Name of the Grid S/S :
Equipment ID :
Date of Testing :
Commissioning date :
Manufacturing year :
Manufacturer :
Oil temperature :

Sl No.	Phase	Mode	Test Connection	Applied Voltage	Capacitance(nF)		Tanδ (%)	Remarks
1	R	UST-A	HT-Cx	3 KV	CHL			
				5 KV				
				10 KV				
2	Y	UST-A	HT-Cx	3 KV	CHL			
				5 KV				
				10 KV				
3	B	UST-A	HT-Cx	3 KV	CHL			
				5 KV				
				10 KV				

NB - *According to IEEE C57.13-2016, the **Tan-δ limit** is 0.5% (max.) for Current Transformer.*

Recommendation:

- ☐ Result satisfactory.
- ☐ Need Observation. Retest after ___ month.
- ☐ Replace the _____ phase ____ immediately.

Comment:

Tested By:	Verified By:	C/S By:
Assistant Engineer/ Sub-divisional Engineer RTS, PGCB	Executive Engineer, RTS, PGCB	Superintending Engineer RTS, PGCB

Reviewed by CE (T-1)

Approved by ED (O&M)

Circuit Breaker Timing Test

Test Instrument Used :
Sub Station Name :
Date of Testing :
Breaker ID :
Manufacturer :
Manufacturing Year :
Operating Mechanism :
Ambient temperature : °C

Test Result

SL. NO.	PHASE	TRIP 1 (ms)	TRIP 2 (ms)	CLOSE (ms)	C-O (ms)	REMARKS
1.	R					
2.	Y					
3.	B					

Recommendation:

- ☐ Result Satisfactory.
- ☐ Need observation.
- ☐ Warning. Replace _____ phase immediately.

Comments:

Tested By:	Witnessed By:	C/S By:
Assistant/Sub-divisional Engineer, RTS, PGCB	Executive Engineer RTS, PGCB	Superintending Engineer RTS, PGCB

Reviewed by CE (T-1)

Approved by ED (O&M)

Circuit Breaker Contact Resistance Test

Test Instrument Used :
Sub Station Name :
Date of Testing :
Breaker ID :
Manufacturer :
Manufacturing Year :
Operating Mechanism :
Ambient temperature : °C

Test Result

Sl. No.	Phase	Test Current (A)	Resistance (micro ohm)	Remarks
1.	R			
2.	Y			
3.	B			

Recommendation:

- ☐ Result Satisfactory.
- ☐ Need observation. Retest after …….. Month.
- ☐ Warning. Replace immediately.

Comments:-

Tested By:	Witnessed By:	C/S By:
Assistant/Sub-divisional Engineer, RTS, PGCB	Executive Engineer RTS, PGCB	Superintending Engineer RTS, PGCB

Reviewed by CE (T-1)

Approved by ED (O&M)

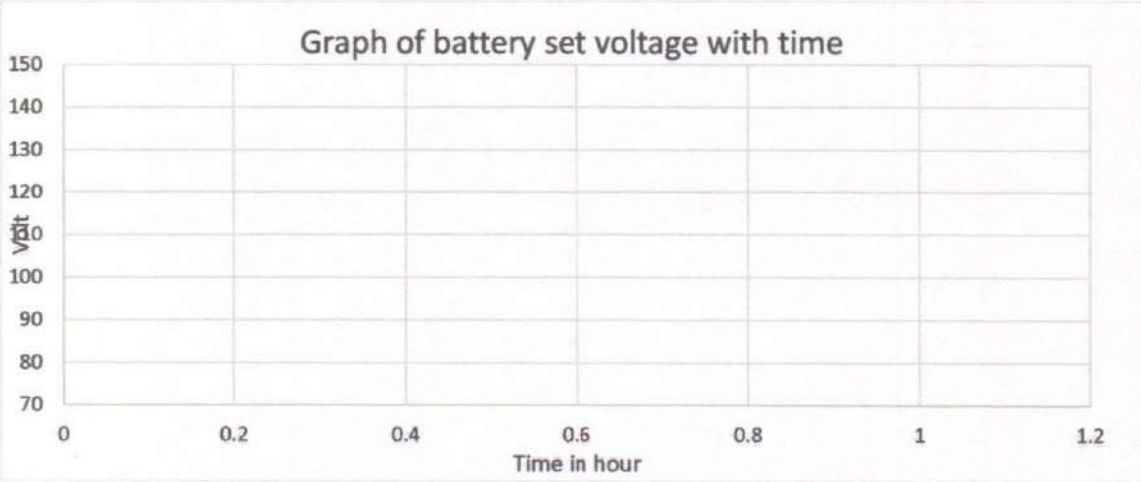
Battery Load Test

Substation Name:	Date:

Equipment ID:	Test Equipment:
Battery Type:	Batter Location:
Capacity:	End Cell Voltage:
Manufacturer:	Electrolyte Temp:
No. of Cell:	Year of Manufacturing:

Test Result

Sl.	Time	Discharging Current	Total Battery Voltage (Volt)	Avg. Cell Voltage	Amp-Hour
1.	Pre-discharge				
2.	0.01	Amp			
3.	0.30				
4.	1.00				
5.	1.30				
6.	2.00				
7.	2.30				
9.	3.00				
10.	3:30				
11.	4:00				
12.	4:30				
13.	5:00				



Comments:

Tested By	Acknowledge By	Witnessed/Checked By	Counter signed By
AE/SDE, RTS,PGCB		Executive Engineer, RTS, PGCB	Superintending Engineer, RTS, PGCB

Reviewed by CE (T-1)

Approved by ED (O&M)