




Comprehensive Audit:

1. Name of the Sub-Station: Kokrajhar GSS
2. Voltage level: 132/33 KV
3. Owner: AEGCL
4. Date of Audit: 17-11-2021
5. Members of Auditing Team:

Sl.No.	Name	Designation	Organization	Signature
1.	Rajib Das	AE	NERDC	
2.	Bikash Kishor Bora	Engineer	PGCIL.	
3.	Ashim Kumar Nath	Engineer	NERLDC, POSOCO	

6. Representatives of the Sub-station/Generating Station assisting the auditing team:

[illegible]

Observations/Recommendations:

Sl.No.	Parameters	Yes/NO	Remarks
1	Whether redundant supply for station auxiliaries is available?	NO	
2	Whether SCADA system is present?	Yes	
3	Whether SAS has been implemented? If no, whether panels are SAS compliant?	Yes	
4	Whether protection relays for transformers/ICTs/reactors are operational?	Yes.	
5	Whether reliability by way of Bus-Bar scheme is present in 132kV station?	Yes	Main 2 Transfer Bus Scheme.
6	Whether Double Main Arrangement is present in 220kV Station? If yes, whether operational or not?	NA	
7	Whether Bus Bar Protection is available for the 220kV and above station?	NA	
8	Whether protection relays for emanating lines are operational?	Yes.	
9	Whether time synchronisation facility is available in the Sub-station?	Yes.	Bnt GPS alarm is persisting.
10	Whether existing RTUs are healthy and reporting?	Yes.	
11	Whether existing communication via PLCC or OPGW? If PLCC then healthiness of PLCC panels	PLCC.	PLCC Unhealthy for Bilasipara feeder.

12	In case of OPGW connectivity to the station, whether end equipments are available and functional?	N/A.	
13	Whether all analog/digital points are reporting in local SCADA?	Yes.	
14	Healthiness of Protection coupler/Coupling device?	Yes.	
15	Whether sufficient lighting is available in the switchyard?	Yes.	
16	DC Supply- Whether two DC sources are available?	No.	Only One DC source available.
17	Earthing System in the switchyard: Whether as per IS?	Yes.	
18	List of diagnostic tools, testing equipments etc. and whether are present in sufficient quantity?		
19	Whether firefighting provision is available in the station?	No.	Transformer fire protection system is not available.
20	Whether Protection Audit has ever been carried out before? If yes then compliance status of Audit Observations/Recommendations	No.	
21	Whether all relay settings have been submitted in PDMS? If no, then compliance status	No.	
22	Whether CTs, PTs/CVTs of sufficient accuracy is present in the station?	Yes	

Any other specific observations/recommendations:

1. Differential relay of Transformer 2 having trouble alarm (5NTP fail).
Same may be rectified.
2. Earner fail alarm persisting in Salati-1 & Bilaspur-1 line. Same may be rectified.
3. Auto-reclose switch is in man. Auto mode for Bilaspur-2 & Salati-2 line. Same may be kept on per instruction & record should be kept.
4. Gateway 2 is in off condition.
5. DE is not healthy.
6. Only One DC source available at site. for both 110V & 48V source.
7. DE Earth fault persisting in the DC source.
(1V to earth = 0.3V
ve to earth = -118.7V)

8. Oil leakage observed in both the transformers. Same may be arrested for both.
9. No fire fighting protection available for the transformers.
10. LA counters of LV side for Transformer-1 is in damaged condition.
11. 3rd Party audit report to be submitted.
12. Task Force report to be submitted.
13. PDMS report to be submitted.
14. GPS clock & time sync problem may be resolved.

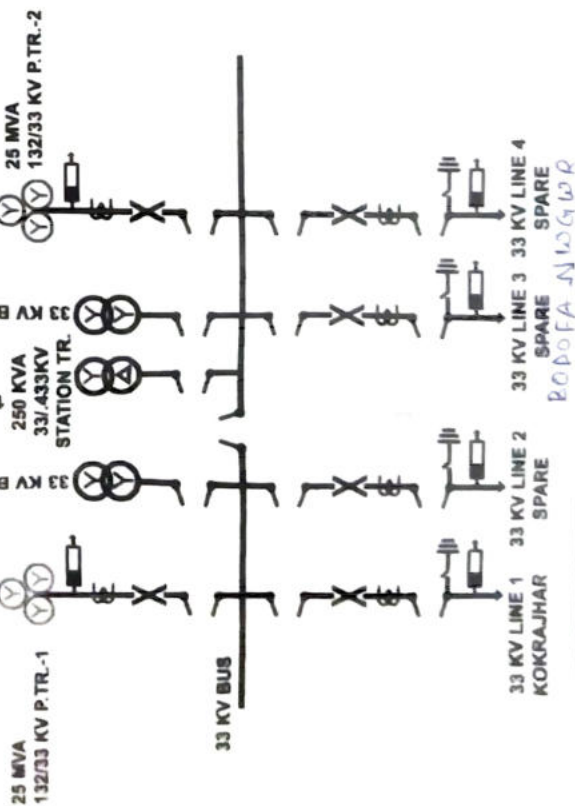
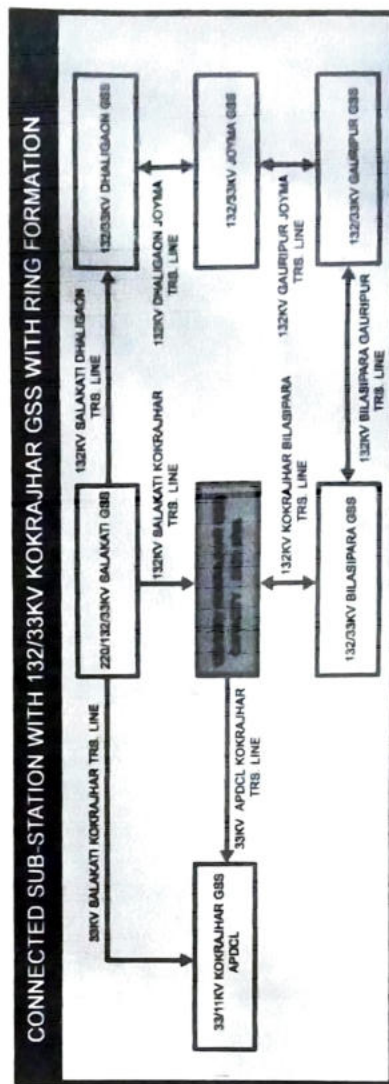
For 132KV Kakrajhar G.S.S.











1. ~~Pal~~ (Gopal Pal)
2. ~~Baruti~~ (Bibek Baruti)

For Audit Team

1. ~~Das~~ (Rajib Das)
2. ~~CPWS~~ (BIKASH KISHOR)
17/11/21 BOKA
3. ~~Sah~~ (ASHIM KUMAR NATH)
17/11/21

132KV Salakati Line 2



LEGENDS	
	LIGHTNING ARRESTER
	ISOLATOR WITHOUT EARTH SWITCH
	ISOLATOR WITH SINGLE EARTH SWITCH
	WAVE TRAP
	POWER TRANSFORMER WITH OLTC
	CAPACITIVE VOLTAGE TRANSFORMER
	CIRCUIT BREAKER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	STATION TRANSFORMER

**ASSAM ELECTRICITY GRID
CORPORATION LIMITED**

**132/33KV KOKRAJHAR GRID
SUB-STATION**

DATE: 11/11/2020

14A. PERIODICITY OF MAINTENANCE OF SUBSTATION EQUIPMENT / TRANSMISSION LINE COMPONENTS/ELEMENTS

Sl. No.	Equipment	Tests being conducted	Preiodicity of Tests being conducted (Put "Y" under appropriate column)				
			3 months	6 months	1 year	> 1 year	No test is being done
1	Transformer / Reactor	Winding resistance measurement			Y		
		Voltage Ratio test for transformer			Y		
		Magnetising current test			Y		
		Magnetic balance test			Y		
		Insulation Resistance (IR) Measurement			Y		
		Polarisation Index (PI)			Y		
		Capacitance & Tandelta Measurement for			Y		
		(a) Winding			Y		
		(b) Bushing			Y		
		Break Down Voltage (BDV)Test for oil			Y		
		Dissolved Gas Analysis(DGA)			Y		
		Sweep Frequency Response Analysis(SFRA)					No test
		Partial Discharge (PD) Measurement					
		Degree of Polymerisation (DP) for cellulose insulation					
		Furan Analysis					
		Vibration Measurement for reactors					
		Check of various earthing connections					
		Any other test (Please mention)					
2	Circuit Breaker (CB)	Static Contact Resistance Measurement			Y		
		Dynamic Contact Resistance Measurement (DCRM)					No test
		Operating timing of CB (Opening Time, Closing time, CO)			Y		
		Operating timing of Pre Insertion Resistor (Pre-insertion time)					
		Capacitance & Tandelta measurement for Grading capacitors					
		Healthiness of Trip Coil (TC) & Closing Coil (CC)			Y		
		Healthiness of Operating Mechanism			Y		
		Dew point measurement of SF6 gas					No test
		Check of various earthing connections					
		Any other test (Please mention)					
3	Isolator / Disconnectors	Static Contact Resistance Measurement			Y		
		Healthiness of Operating Mechanism			Y		
		Checking of Interlocks with CB, Earthing switches etc.					No test
		Check of various earthing connections					
		Any other test (Please mention)					
4	Current Transformer(CT)	Capacitance & Tandelta Measurement			Y		
		Insulation Resistance (IR) Measurement			Y		
	Current Transformer(CT)	Measurement of secondary winding resistance			Y		

14A. PERIODICITY OF MAINTENANCE OF SUBSTATION EQUIPMENT / TRANSMISSION LINE COMPONENTS/ELEMENTS

		Partial Discharge (PD) measurement					
		Check of various earthing connections					
		Any other test (Please mention)					
5	Potential	Capacitance & Tandelata Measurement					
		Insulation Resistance (IR) Measurement					
		Partial Discharge (PD) measurement					
		Check of various earthing connections					
		Any other test (Please mention)					
6	Capacitive Voltage Transformer (CVT)	Capacitance & Tandelata Measurement			Y		
		Insulation Resistance (IR) Measurement			Y		
		Secondary Voltage Measurement			Y		
		Partial Discharge (PD) measurement					
		Check of various earthing connections					
		Any other test (Please mention)					
7	Surge Arrester (SA)	3rd Harmonic Leakage Current Measurement				Y	
		Capacitance Measurement					Notes/r
		Insulation Resistance (IR) Measurement			Y		
		Check of various earthing connections					
		Any other test (Please mention)					
8	Relays	Functional tests of each Protection relay				Y	
		Operating timings				Y	
		Testing of DR/EL with TSE				Y	
9	PLCC system	Checking of PLCC system					Notes/r
10	Battery	Measurement of specific gravity of electrolyte (for flooded battery)					
		Topping of battery using Demineralized / Distilled water (for flooded battery)					
		Open Circuit Voltage of Cells Tests					Notes/r
		Capacity test					Notes/r
		Checking of earth fault due to leakage (for flooded battery)					
11	Earthing	Resistance of Earth mat	Y				
12	Hot Spot	Infrared scanning					
		(a) Inside switch yard / substation (for clamps , connectors etc.)	Y				
		(b) Transmission lines (Clamps, connectors, Jumpers etc.)	Y				
13	Insulator	Punncture Insulator Detection					
		Cleaning of Porcelain / Glass insulators					
		(a) Normal washing					
		(b) Hotline washing					
14	Tower	Tower footing resistance measurement					

(NO TOOLS available) 1

14B. AVAILABILITY OF VARIOUS DIAGNOSTIC TOOLS

Sl. No.	DIAGNOSTIC TOOLS	Avail-ability	If Yes (i.e. if Available)	
		(Y/N)	Make	Model
1	Winding resistance meter	Y	DV POWERS	
2	Transformer Voltage Ratio test meter	Y	SCOPE	
3	Insulation Resistance (IR) tester			
	(a) 5 kV	Y	SONEL	
	(b) 10 kV	Y	SONEL	
4	Capacitance & Tandelata Measurement Instrument			
	(a) Automatic	Y	HAFLY	
	(b) Manual			
5	Break Down Voltage (BDV) Test kit for oil	Y	BEACON	
6	Dissolved Gas Analyser	Y	MYRKOS & MORGAN SCHAFER	
7	Sweep Frequency Response Analysis(SFRA) test kit	Y	HAFLY	
8	Partial Discharge (PD) Measuring Instrument			
9	CB operational Analyser			
10	DCRM test kit	Y	SCOPE	
11	SF6 Gas leakage detector	Y	HENAN RELATIONS	
12	Dew point measuring instrument	Y	HENAN RELATIONS	
13	SF6 Gas Handling Plant (for Evacuation, filling, filtering of gas)			
14	Static Contact Resistance Measuring instrument	Y	SCOPE	
15	Leakage Current Meter (LCM)	Y	BEACON	
16	Earth Tester	Y	FLUKE	
17	Automatic Realy test kit	Y	OMICRON	
18	Thermovision camera for detection of hot spots			
19	Thermal Scanner (for Transformer / Reactor)	Y	FLUKE	
20	Transmission line Response Analyser	Y	FLUKE	
21	Punncture Insulator Detector (PID)	N		
22	On line Partial Discharge (PD) monitoring of GIS	N		
	If Yes			
	(a) Using Ultra High Frequency (UHF) technique			
	(b) Using Acoustic technique			
22	Any On line diagnostic tools	N		
	If Yes, List the instruments			
	(a)			
	(b)			
	(c)			

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14C. VARIOUS PROVISION IN SUBSTATION / SWITCHYARD

Sl. No.	VARIOUS PROVISION	Availability
		(Y/N)
1	Soak Pit for transformer / reactors of 10MVA and above rating or with oil capacity more than 2000ltrs	N
2	Oil Collecting pit for transformer / reactors	N
3	CO2 and sand buckets	Y
4	Foam type fire extinguisher	Y
5	Portable type fire extinguisher	Y
6	Hydrant Type	Y
7	High Velocity Water Spray (HVWS) System	N
8	Nitrogen Injection Based Fire Protection System (NIFPS)	N
9	Both HVWS system & NIFPS	N
10	Fire Fighting wall between Transformers (if distance between transformers < 15m)	Y
11	Direct Lightning Protection	
	(a) Using Over Head Ground Wire(OHGW)	
	(b) Using Spikes	Y
	(c) Using Lightning Masts(LMs)	
	(d) Combination of OHGW + LM	
	(e)Combination of OHGW + Spikes	
12	Condition of Earthing System	
	(a) Gravels Spread ove Pre-Stressed Concrete (PCC)	Y
	(b) Only Gravels	
	(c) Gravels are visible	
	(d) Gravels coverd with grass / soil	
13	Operation of On Load Tap Changer (OLTC)	
	(a) As and when required	Y
	(b) Never operated	
14	Operation of Off Load Tap Changer	
	(a) As and when required	
	(b) Never operated	
15	DG Set	No
	If Yes, Rating (Nos., Voltage level, KVA capacity)	—