

### Comprehensive Audit:

1. Name of the Sub-Station: 220/132/66/33 kV 2x100 MVA Insulated
2. Voltage level: 220 kV
3. Owner: AEGU
4. Date of Audit: 13/11/2021
5. Members of Auditing Team:

Sl.No.	Name	Designation	Organization	Signature
1	SRITIT MUKHERJEE	DD	NERPC	S Mukherjee
2	PINAK NANDI	Mgr.	PGCIL.	Pinn
3	CHITRA BAHADUR THAPA	Dy Mgr	NERLDC	Chy

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

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Observations/Recommendations:		Yes/NO	Remarks
Sl.No.	Parameters		
1	Whether redundant supply for station auxiliaries is available?	Yes	33/0.4 KV 250KVA SS 1 no. 250 KVA DG set
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 & Transfer Scheme
6	Whether Double Main Arrangement is present in 220kV Station? If yes, whether operational or not?	Yes	Double Main Cum Transfer Scheme *
7	Whether Bus Bar Protection is available for the 220kV and above station?	Yes	-
8	Whether protection relays for emanating lines are operational?	Yes.	-
9	Whether time synchronisation facility is available in the Sub-station?	Yes	-
10	Whether existing RTUs are healthy and reporting?	Yes.	
11	Whether existing communication via PLCC or OPGW? If PLCC then healthiness of PLCC panels	OPGW	

S. M. S. /  
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\* All feeders (220kV) connected to Bus-1. Feeders to be segregated.

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Minu Singh  
14/11/2021

12	In case of OPGW connectivity to the station, whether end equipments are available and functional?	Yes	—
13	Whether all analog/digital points are reporting in local SCADA?	Yes. Partially	Some of the digital points as per Annexure-I is not reporting and is to be rectified
14	Healthiness of Protection coupler/Coupling device?	Yes.	
15	Whether sufficient lighting is available in the switchyard?	No.	Insufficient in entire switchyard. To be procured.
16	DC Supply- Whether two DC sources are available?	Yes	220V : 2 Battery Bank 110V : 2 Battery Bank 48V : 2 Battery Bank
17	Earthing System in the switchyard: Whether as per IS?	Partially Yes	132 KV and 33 KV earthing to be improved
18	List of diagnostic tools, testing equipments etc. and whether are present in sufficient quantity?	No.	To be procured as per list
19	Whether firefighting provision is available in the station?	Partially Yes.	NIPS present in 2 nos. 100 MVA CTs. No arrangement for 2x40 MVA ICTs.
20	Whether Protection Audit has ever been carried out before? If yes then compliance status of Audit Observations/Recommendations	Yes.	Compliance status as per attachment.
21	Whether all relay settings have been submitted in PDMS? If no, then compliance status	No.	After upgradation to SAS, all relays replaced. Settings to be submitted
22	Whether CTs, PTs/CVTs of sufficient accuracy is present in the station?	No	*

Any other specific observations/recommendations:

- 1) Battery Bank Source 2 (220V & 132 KV) earthing to be done
  - 2) 220V Source -1 Negative Earth Fault present and is to be rectified
  - 3) PLCC link of DeBurgan feeder is not working.
  - 4) Battery Bank Discharge Test to be done to measure the healthiness. If capacity is found less, procurement to be done
  - 5) Fire Fighting Arrangement to be done for 132/33 KV, 2x40 MVA ICTs.
- S. M. Chakraborty  
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 Mr. Chakraborty  
 13/11  
 Mr. Chakraborty  
 14/11



# Audit Observations / Recommendations of 220/132 KV Tinsukia SS

- 6) 0.5 Accuracy Class CT available for AGBPP 1 and 2 feeders, Bus Coupler, 100 MVA ICT 1 and 2 HV side, Dibrugarh, NTPS Bordubri, Rupai feeders.  
1.0 Accuracy Class CT available for NTPS 1 and 2 feeders.  
100 MVA ICT 1 LV side  
All to be replaced with 0.2S Accuracy Class CTs.
- 7) Cable trenches to be covered with trench slabs.
- 8) Auto-Reclosure Scheme in 220 KV and 132 KV to be made operational.
- 9) AC to be installed in Battery Room.
- 10) Scrap material lying in the switchyard to be disposed.
- 11) Obsolete/Unserviceable CBs at AGBPP end for 220 KV AGBPP - Tinsukia P/C to be replaced.
- 12) 220/132 KV, 100 MVA ICT-1 HV side CBs to be replaced as it is found to be obsolete/unserviceable.
- 13) 4 nos. isolators of AGBPP - Tinsukia line at AGBPP end needs to be replaced along with CT switching to be checked. (Same is noted here as AEGCL is Bay owner at AGBPP end)
- 14) Deviation found in 220 KV Bus-1 PT. To be replaced.

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C. Phap 13/11/21      Minu PSingh 13/11/21      [Signature]      [Signature]

Sl. No.	Recommendations during Protection Audit 2013	Status as on 06.08.18 (Attended/Not Attended)	If Not complied, target date of completion
	<b>old MOCBs to be replaced with SF6 CBs</b>		
1	all 66 kV line bays should be provided with Cb and CT of suitable ratings	attended	
2	with rewire protection	abolished	
3	The old gapped type SA, if exists, need to be replaced by heavy duty station class, gapless type surge arrester of suitable rating. The healthiness of old Gapless Surge Arrester need to be ensured, and may be replaced, if required.		
4	No. of CT cores are not adequate. CT accuracy class is not as per CEA's regulations, CT ratio is not suitable for bus bar protection. CTs of suitable ratios (if bus bar protection is to be provided) and accuracy class need to be provided. The healthiness of old CTs need to be ensured and may be replaced, if required.	attended	
5	PT/CVTs accuracy class is not as per CEA regulation. PT/CVTs of suitable accuracy class need to be provided. The healthiness of old PT/CVTs need to be ensured and may be replaced, if required.	attended	
6	practice of using 2 DC system voltage (110 and 220 V) should be avoided	not attended	<del>Not</del> will be replaced not possible
7	Two sets of batteries (110V) with associated chargers for station DC supply and two sets of batteries (48V) with associated chargers for reliable communication system shall be in place as per CEA's regulations.		
8	DG set not available	attended	
9	all 66 kV line bays should be provided with Cb and CT of suitable ratings with rewire protection	system abolished	by 1st quarter of 2019
1	The bus PT / CVT is being used for both protection and metering of transformer and lines. Dedicated line CVT may be used for distance protection	not attended	attended
11	Protection scheme as per CEA's regulations need to be provided for lines, ICT, EM/static relays to be replaced by Numerical relays complying to IEC 61850 protocol. DR, EL and TSE need to be provided. BC&PU and SAS may be provided. Telecommunication link may be established for communication and protection purpose.	not attended	attended by 1st quarter of 2019
12	Required FF provision has to be made as per CEA's regulations.	Available in 2*100MVA Transformer.	Not available in 2*40MVA, 132/33 kV by 1st quarter of 2019
3	Earthing system needs improvement	not attended	will be proposed
14	The modern diagnostic tools including relay test kit need to be procured to assess healthiness of transmission line and various substation equipment/material including protective relays. Minimum diagnostic tools are to be provided as per CEA's regulations.	Available with testing team	Available with testing team by 2019
15	No LBB, BB protection	not attended	by 2019 attended

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12/11/21  
C. P. Borah  
AAM, AEEL, Tinsukia



	Observations during Protection Audit 2017	Status as on 06.08.18 (Attended/Not Attended)	If Not Attended, Target date of completion
1	Relay setting as RK task force recommendation to be implemented for 220 kV and 132 kV lines. Group A settings of Trinsukia AGBPP D/C of both ends may be reviewed. Grups setting may be reviewd as group B normaslly enabled and group A automatically enabled during carrier failure	attended	
2	Only one 220 V DC source for 220 kV system and one 110 V DC source for 132 kV system .no redundancy ,negative to earthy fault in both	attended	
3	Busbar protection not available for 22 kV	not attended	by 2019 <i>attended</i>
4	Line CVT for 220 kv Tinsukia-AGBPP 2 line nopt available .all DPR for all 132 kV feeder using bus PT voltage input	not attended	<i>attended</i> by 2019
5	Bays not numbered as per std ,no bay/phase identification at switchyard	attended	
6	No GPS system	not attended	by 2019 <i>attended</i>
7	DG set not present	not attended	by 2019 <i>attended</i>
8	Nitrogen fire fighting system available for 2* 100 MVA,220/132 kb T/F.firefghting syste4m not avsaible for switchyard and other T/F	not attended	<i>attended</i>
9	Vegetation to be cleared.	attended	
1	DDC and AC system SLD not available	attended	
11	Old relasys of 66 kV and 33 kV to be replced by numerical relays.	not attended	<i>attended</i> by 2019
12	Old surge arrestersand MOCB to be replaced.surge counter not available for most surge arresters	attended	
13	Periodic testing record not maintained,protection equipment testing tool availabler eith testing anf maintenance team	attended	
14	Silica gel of 2*100 MVA,220/132 transformers to be replaced	attended	

*12/11/21.*

KATHALGURI-I

KATHALGURI-II

NAMRUP-I

NAMRUP-II

220 kV Main Bus-II/Transfer Bus

220 kV Main-I Bus

100 MVA  
220/132  
AUTO100 MVA  
220/132  
AUTO

132 kV Transfer Bus

132 kV M- Bus

40 MVA, 132/33kV  
TR-1

TO SHEET-2

DIBRUGARH

NAMRUP

MARGHERITA

RUPAI

40 MVA, 132/33kV  
TR-2

TO SHEET-2

## EQUIPMENT LEGENDS

POWER TRANSFORMER	CIRCUIT BREAKER	ISOLATOR WITHOUT ED	ISOLATOR WITH ED	CURRENT TRANSFORMER	POTENTIAL TRANSFORMER	LIGHTNING ARRESTER	WIRE TAP	CVT	AIR METER

NOTE: Equipment proposed to be replaced  
are shown in Red colour

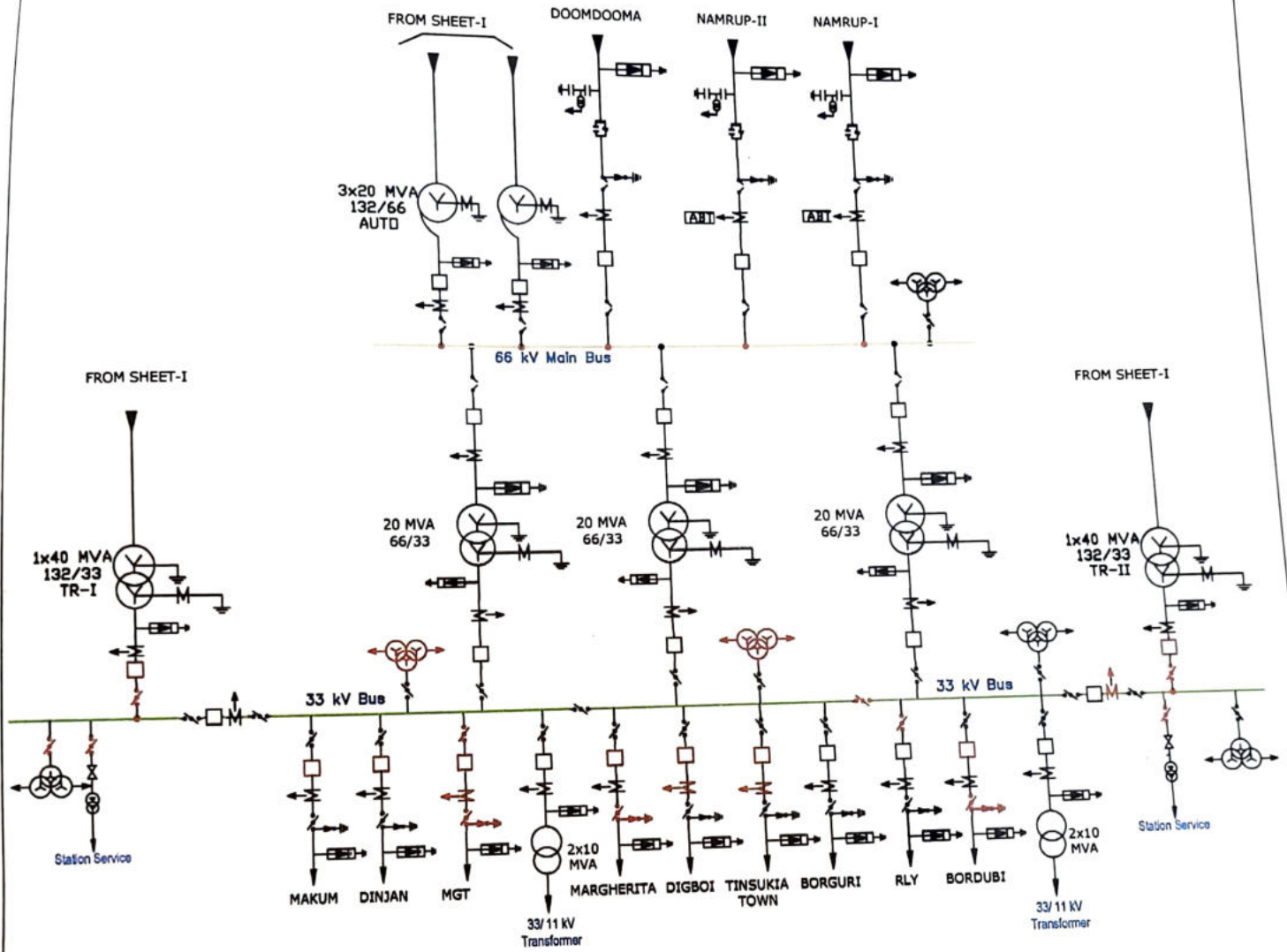
ASSAM ELECTRICITY GRID CORPORATION LIMITED

AS-45 220/132/66/33 KV, TINSUKIA SUBSTATION

SINGLE LINE DIAGRAM OF 220/132/66/33 KV, TINSUKIA SUBSTATION

DRAWING NUMBER: AEGCL/TINSUKIA/SLD/1

Sheet: 1 OF 2



NOTE: Equipment proposed to be replaced are shown in Red colour

#### EQUIPMENT LEGENDS

POWER TRANSFORMER	CIRCUIT BREAKER	ISOLATOR WITHOUT EB	ISOLATOR WITH EB	CURRENT TRANSFORMER	POTENTIAL TRANSFORMER	LIGHTNING ARRESTER	WAVE TRAP	CYT	ABT METER	ABT



ASSAM ELECTRICITY GRID CORPORATION LIMITED

AS-45, 220/132/66/33 KV, TINSUKIA SUBSTATION

SINGLE LINE DIAGRAM OF 220/132/66/33 KV, TINSUKIA SUBSTATION

DRAWING NUMBER: AEGCL/TINSUKIA/SLG/1

Sheet: 2 OF 2



			Status
<u>220KV ISO</u>			
89T	→	N/A	(Not available)
40MVA Tr 2	89T	→	N/A
<u>132KV ISO</u>			
132KV TBC	89T	→	N/A
132KV TBC	89A	→	N/A
RUPAI	89T	→	N/A
MARGH- ERITA	89T	→	N/A
BORDUBI	89T	→	N/A
DIBRUGARH	89T	→	N/A
40MVA Tr 1	89T, 89A, 89L	→	N/A
40MVA Tr 2	89T, 89A, 89L	→	N/A

Chy 13/11

S. Mukherjee  
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