INSPECTION OF 132KV MADU SUBSTATION BAY EXTENSION AT MANDO TRANSMISSION SWITCHYARD, MANDO, KADUNA

132KV TRANSMISSION SUBSTATION EXTENSION BAY AT MANDO, KADUNA, KADUNA STATE

INSPECTION AND TESTING OF 132KV TRANSMISSION SUBSTATION EXTENSION BAY AT MANDO, KADUNA, KADUNA STATE BETWEEN 10TH – 12TH DECEMBER, 2018

CLIENT: Federal Ministry of Power

CONTRACTOR: SKIPPERSEIL LIMITED

CONSULTANT: SEWA

INSPECTING/TESTING AUTHORITY: Nigerian Electricity Management Services Agency (NEMSA)

INTRODUCTION:

The inspection and testing of a 132kV transmission substation extension bay was carried out between Monday 10th and Wednesday 12th December 2018 by NEMSA's team of Engineers and technical officers led by the Managing Director/CEO and Chief Electrical Inspector of the Federation. The following were in attendance:

ATTENDANCE:

S/NO	NAME	ORGANISATION	DESIGNATION	E-MAIL	PHONE
1	ENGR. PETER O. EWESOR	NEMSA HQ	MD/CEO &CEIF	ogetomeegbe@yahoo.co.uk	08036745149
2	ENGR. ALIYU TUKUR	NEMSA HQ	GM(TSIS) HQTRS	aliyutukur67@yahoo.com	08033493741
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4	Engr. U.O Momoh	NEMSA HQ	PM(TS&IS)	u_momoh@yahoo.com	08059234975
5	Engr. Simon T.Y	NEMSA HQ	SM(TS&IS)	theophylussimon@gmail.com	08036312808
6	Engr. E.I Alobo	NEMSA KD IFO	AIE(Kaduna)	ejaalabo@yahoo.com	07035866084
7	Engr. Mubarak Gidah	NEMSA KD IFO	ASSISTANT MANAGER	mcmubix@gmail.com	08034645780
8	Tijjani B.Abiso	NEMSA KD IFO		abosotijjani@gmail.com	07032202637
9	Junaidu Abdullahi	NEMSA KD IFO	OFFICER II		07034203666
10	Engr. Shehu Magaji	NEMSA KD IFO	OFFICER III		08021140828
11	Engr. Ogboma Augustine	SeWa (Consultant)		ogb.oghenen@yahoo.com	08032949281

12	Ishaya Zee	SeWa (Consultant)		zeejing@yahoo.com	07031146874
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15	Engr. Ahmed Asekun	SKIPPER SEIL		ahmed.asekun@yahoo.com	08053204862
16	Niranjan Gupta	SKIPPER SEIL		niranjan.gupta@skipperseil.com	09075921337
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PROJECT DESCRIPTION:

Client: Federal Ministry of Power, Works & Housing

Project consultant: SeWa West Africa Ltd.

Project contractor: Skipper Electricals Ltd

132KV Incoming Feeder One (1)

Source I of 132KV Feeder Kudenda Power plant

OBJECTIVE OF PROJECT:

The project aim and objective is to extend the 132kV transmission substation bay and thereby improve the substation capacity, efficiency and quality of electricity supply in Kaduna and environs.

SUMMARY OF OBSERVATIONS AND RECOMMENDATIONS REQUIRING URGENT ATTENTION

The summary of our observations and recommendations requiring urgent attention include:

i. The newly installed 132KV bus bar was seen not aligned with the existing bus bars. This is unsafe and and could be points of arcing and early failure of the installation. Therefore, Bus bar alignment with existing bus bar should be carried accordingly.

ii. There are no Phase indicators on the gantries and all the line equipment. This is dangerous and unsafe for operation. Phase indication should be provided on top of gantries, on line equipment, by the bus bars, etc.

iii. Some bolts were too short and not providing adequate grip for the structures. Bolts used should be long enough to provide proper tightening/grip. All bolts should be replaced with longer bolts and adequately tightened.

iv. Some bolts and nuts were completely missing and may impair the stability of the steel support structures. A careful overview of all the support structures/gantries should be carried out to identify any other missing bolts and nuts which should be replaced with appropriate galvanized bolts/nuts/washers.

PHYSICAL INSPECTION, OBSERVATIONS AND RECOMMENDATIONS

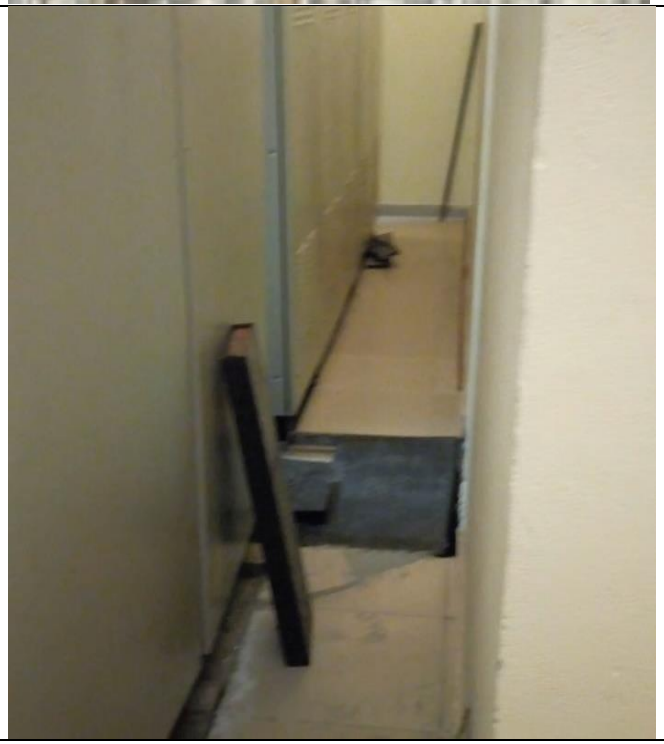
S/NO	LOCATION	OBSERVATIONS	PICTURES	RECOMMENDATIONS
1.	Substation Switchyard	Insufficient clearance between the existing High voltage 132kV O-H line and the newly constructed terminal gantry for the bay extension.		Sufficient clearance between the High voltage 132KV line and the tower

	Substation Switchyard	Busbars were observed not aligned with the existing busbars at the point of contact/joint. This is dangerous and unsafe as arcing can occur due to poor contact, with disastrous consequences.		Busbars must be adjusted and aligned.
	Substation Switchyard	Close joints were observed on the 132KV bus bar. This is a poor construction. Too many closed joints on bus bar should be avoided as they represent a source of arcing and failure of the bus bar system.		Full length bus bars should be used. No joints.

	Substation Switchyard	Close joints were observed on the 132KV bus bar. This is a poor construction. Too many closed joints on bus bar should be avoided as they represent a source of arcing and failure of the bus bar system.		Full length bus bars should be used. No joints.
2.	Substation Switchyard	Several support structures have not been grouted adequately. This could lead to rusting of the ungalvanized bolts and eventual failure of the support structure.		All support structures must have the concrete bases grouted appropriately.

	Substation Switchyard	Cable PVC pipes were not properly covered. This will allow ingress of water/reptiles/rodents to the control room through the PVC pipes.		The PVC pipes should be plugged/properly covered.
	Substation Switchyard	Cables were seen exposed under the control panel in the switch yard along with the cable duct. This is unsafe as reptiles and rodents can gain access to the control room through the exposed cable ducts		The panel base should be covered.

	Substation Switchyard	No nuts on the bolt to hold the panel firmly in place. During strong windstorms the panel could be displaced causing a serious electrical accident.		Bolts and nuts must be used to firmly hold the panel in place.
	Substation Switchyard	Most bolts and nuts used in the gantry were seen rusted.		Rusted bolts & nuts should be replaced.

	Substation Switchyard	Unused concrete pillar was seen in the substation switch yard. This is dangerous and unsafe as it can result in trip accident during inspection and maintenance.		Unused concrete pillar must be removed from the substation switch yard to avoid operators getting injured during maintenance.
	Control room	Insufficient clearance observed between the wall and the panels. This is unsafe especially during switching operation.		Adequate safety clearance should be provided between the wall and the panels. The minimum safety clearance is 1.2m

	Control room	Not enough work safe area was observed. This is unsafe for the operators during switching operation.		Enough work safe area must be provided.
				
	Substation Switchyard	Cracked concrete pillar for one of the gantry was observed.		Concrete pillar must be reconstructed.

	Substation Switchyard	Lightning arrestors were seen not earthed.		Lightning arrestors must be properly earthed with earth resistance value of less than 2 Ohms.

GENERAL OBSERVATIONS

1. The 132kV TCN Madu transmission bay extension at Mando, Kaduna, Kaduna State was found defective in some critical respects which have been pointed out to the Contractor's team and highlighted in the observations above. These defects should be remedied with intimation to this office for reinspection before the extension bay can be put to use. Some of the defects include:

v. The newly installed 132KV bus bar was seen not aligned with the existing bus bars. This is unsafe and and could be points of arcing and early failure of the installation. Therefore, Bus bar alignment with existing bus bar should be carried accordingly.

vi. There are no Phase indicators on the gantries and all the line equipment. This is dangerous and unsafe for operation. Phase indication should be provided on top of gantries, on line equipment, by the bus bars, etc.

vii. Close joints were observed on the 132KV bus bar. This is a poor construction. Too many closed joints on bus bar should be avoided as they represent a source of arcing and failure of the bus bar system.

viii. Some bolts were too short or completely missing and may impair the stability of the steel support structures. A careful overview of all the support structures/gantries should be carried out to identify any other missing bolts and nuts which should be replaced with appropriate galvanized bolts/nuts/washers.

CONCLUSION

Please note that the inspection and certification of the 132kV Transmission Bay Extension at Mando, Kaduna, Kaduna State have been carried out in line with NEMSA Act 2015. You are to make the necessary payment of inspection fees** of **ONE MILLION TWO HUNDRED THOUSAND NAIRA ONLY (N1,200,000.00)** into TSA/CBN/ NIGERIAN ELECTRICITY MANAGEMENT SERVICES AGENCY ACCOUNT CBN/NEMSA/IS-KDN/……

Signed by:

INSPECTING /TESTING AUTHORITY:

NIGERIAN ELECTRICITY MANAGEMENT SERVICES AGENCY……DATE……..

NIGERIAN ELECTRICITY MANAGEMENT SERVICES AGENCY……DATE……..

CONTRACTOR:

SKIPPERSEIL LIMITED, ABUJA:……DATE……

CLIENT:

FEDERAL MINISTRY OF POWER, WORKS AND HOUSING:……DATE……

NOTES: (i) THIS IS NOT A CERTIFICATE (ii) Inspection Fees based on Substation Capacity of 120MVA Substation.