

# Gas Insulated Substations

**O**PERATION

**M**AINTENANCE

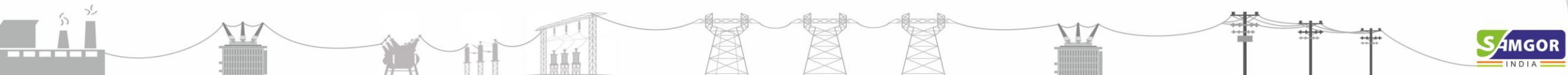
**R**EPAIR



# Business Verticals

|| About SAMGOR

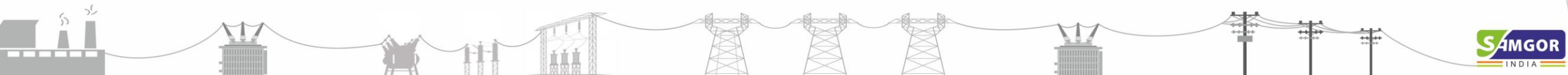
- Services –** Gas Insulated Substations, Transformers, Cables, AIS Substations  
**O&M&R** of GIS Substations for up to 400kV Class
- Manufacturing –** HV test systems, Impulse Generators, Standard Capacitors, PD coupling capacitors, HV dividers
- Calibration –** NABL ISO/IEC17025 accredited, AC / DC High voltage, Capacitance & Tan-Delta, Lab/On-site equipment



# Company Highlights

|| About SAMGOR

- Only company having ALL assets & technical expertise for GIS up to 765kV class
- Global reach. Footprints in Middle East, Africa, South America, South Asia
- Have worked for & trusted by all OEMs – GE, Siemens, Hyosung, CG, ABB, Hitachi, Schneider, XD, Pinggao, Taikai, Sieyuan, KEI, KEC, Universal, Brugg, Pfisterer, L&T, etc.
- 750+ bays installation, 250+ bays commissioning, 1000+ bays HV tested
- Have the highest number & highest capacity of on-site HV test systems
- EHV Cable testing up to 400kV



# Our Assets & Capabilities

|| About SAMGOR

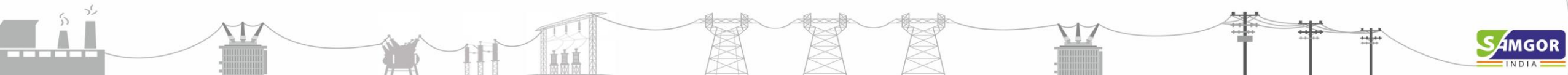
Spare parts like O-rings, consumables etc. sourced & stocked

Development capability for contact springs & conductors etc.

Design team with reverse engineering capability

Mfg set-up gives advantage of know-how of SF6 based system

500kV HV test system and 800kV 80kJ Impulse test system at in-house lab



# Technical Specs

|| 600kV HV system

- Reactor x 2 – 300kV 6000kVAr per stage
- HV Divider x 2 – 300kV 20nF per stage
- HV Transformer – 200kVA/4-6-8-10-12kV
- EPS – 300kVA/350V 20-300Hz
- Control & Measuring system x 1
- Transport Container 20''
- System Weight – 12,000 kgs

(including cables, corona shields, mounting bases etc)



Input Power – 300kVA 3-ph 400V 60Hz (max)

Typical Power – 50kVA (for GIS testing)

200kVA (for cable testing)



# Modular Configuration

|| 600kV HV system

## Single Reactor

Max V – 300kV

Max I – 20A

GIS Load C – 30nF (20 bays)

Cable Load C – 400nF  
(1.5kms)



132kV GIS / 132-220kV Cable

## 2 Reactor - Series

Max V – 600kV

Max I – 20A

GIS Load C – 18nF (15 bays)

Cable Load C – 100nF  
(0.5kms)



132-220-400kV GIS & Cable

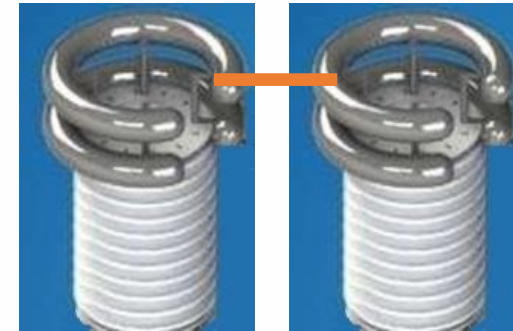
## 2 Reactor - Parallel

Max V – 300kV

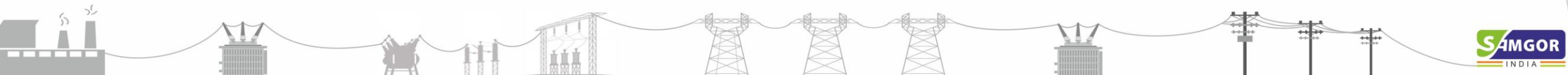
Max I – 40A

GIS Load C – 60nF (40 bays)

Cable Load C – 800nF  
(3kms)



132kV GIS & 132-220kV Cable

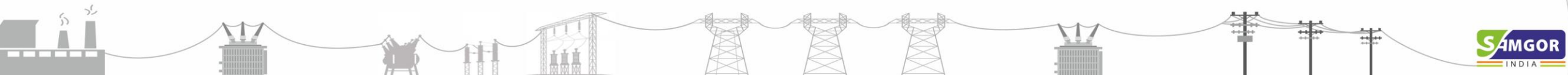


# Post-Installation Services

|| Topic of the day

How they are different from each other?

OPERATION	MAINTENANCE	REPAIR
Daily activity	Pre-determined activity	Down-time activity
To run the system, that involves activation & execution of its functions, on a regular basis	To prevent unplanned downtime that causes of lost productivity, delays, lost revenue	To correct known fault in partial OR complete emergency failure
Operational activities	Inspection, functional checks, repairing, replacing components to prevent breakdowns & ensure optimal performance	Fault finding, Repair and/or fault arrest
✓	✓	✓
Crucial	OEM advised	Urgent basis



# WHY and HOW?

## || Repair & Maintenance



### WHY it is necessary?

Insufficient training from OEM to end-customer

Domain expertise

Expensive OEM support

No preventive maintenance

Spares/equipment's unavailability

### HOW to do it?

Experiential scheduling

Focus on weak links

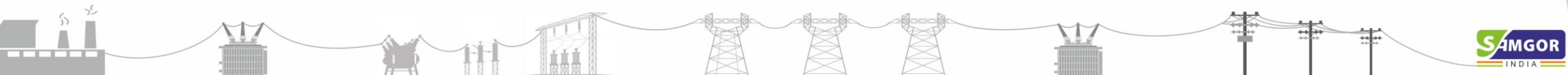
Continuous hands-on Training

Experience sharing

Stock management / spares supply

Equipment maintenance & calibration

Unbiased reporting





# Advantages of Choosing Us

|| Repair & Maintenance

## Reliability

Personnel with decades of experience

Experience across complete plethora of GIS

Proven track record of successful repairs

## Assets – Human and Equipment's

Availability of all assets for emergency works

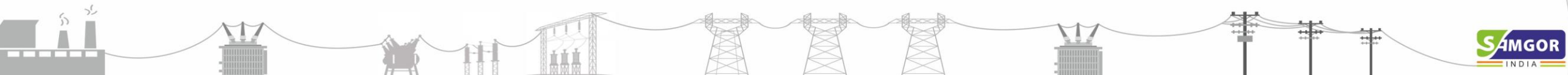
In-house team for electrical & mechanical expertise

## Life-cycle support

Installation, Testing & Commissioning

Repairs & retrofit

Preventive Maintenance plan



# Our Work References

## || Past Projects

Customer	Site Location	GIS Service Description	GIS kV Class	GIS Make
PGCIL	Navi Mumbai	Gas density monitor checking	400/220 kV	ABB
PGCIL	Navi Mumbai	Spare part supply	400kV	ABB
Sembcorp (multiple)	Oman	Gas leakage arrest	132kV	Xian XD
Techno Electric / PGCIL	Siliguri	SF6 gas leakage arrest & GDM checking	400kV	Xian XD
Techno Electric / PGCIL	Gaya	SF6 gas leakage arrest	220kV	Xian XD
Techno Electric / PGCIL	Tanda	CB replacement	400kV	Xian XD
T&R Switchgear	Jewar	HGIS repair & testing	220kV	Jiangsu Jingke
KSEB	Kochi	Gas leakage arrest	66kV	Holec
IL&FS	Cuddalore	CT replacement	400kV	Xian XD
PGCIL	Chandwa	Gas leakage arrest	400kV	Hyosung
Techno Electric / PGCIL	Chandwa	CB replacement	400kV	Xian XD
Meghalaya Power Transmission	Bara Killing	SF6 Gas leakage rectification	400/220 kV	Hyosung
NLNG	Nigeria	VT replacement	132kV	ABB
Bihar Grid Company Ltd	Shekhopursarai	SF6 Gas leakage rectification	220kV	Hitachi
BGCL	Bhagalpur	GIS DS/ES replacement	220kV	ABB
KEI / NHPC	Uri	GIS cable termination work	220kV	ABB



# 132kV GIS Leak Arrest

## || Past Projects

Customer: Sembcorp Salalah Power & Water Company SAOG

Project: SF6 gas leak arrest and analysis

Project Location: Salalah, Oman

Project Duration: 7 Oct to 29 Oct-2021

GIS Make & Type: Xian XD – Outdoor GIS



# 132kV GIS Leak Arrest

|| Past Projects

## Work Flow

Task1 - Leakage identification

Task2 - SF6 gas checking and recovery

Task3 - GIS bus dismantling

Task4 - Flange cleaning and repair

Task5 - GIS bus assembly and docking

Task6 - Gas filling

Task7 - Checking and charging

Task8 - Recommendations



# 400kV CT Replacement

Customer: IL&FS (ITPCL)

Project: 400kV GIS CT replacement work

Project Location: Cuddalore

Project Duration: 14 Jul to 28 Jul-2023

GIS Make & Type: Xian XD – Indoor GIS

## || Past Projects



# 400kV Leakage Repair

Customer: Meghalaya Power Transmission

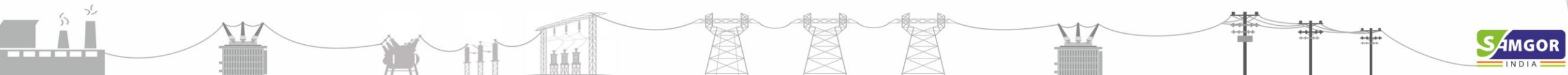
Project: 400kV SF6 gas leakage repair

Project Location: Meghalaya

Project Duration: 18 Dec-2023 to 22 Jan-2024

GIS Make & Type: Hyosung – Outdoor GIS

## || Past Projects



# 400kV CB Replacement

Customer: Techno Electric (NTPC)

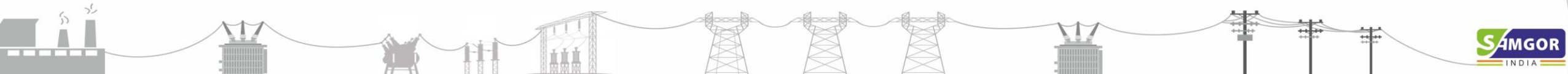
Project: 400kV CB pole replacement

Project Location: Tanda

Project Duration: 1 Dec to 11 Dec-2022

GIS Make & Type: Xian XD – Indoor GIS

## || Past Projects



# 66kV SF6 Leakage Repair

|| Past Projects

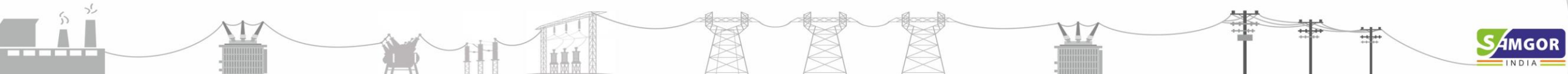
Customer: KSEB

Project: 33kV SF6 gas leakage rectification

Project Location: Kochi

Project Duration: 24 Nov to 30 Nov-2023

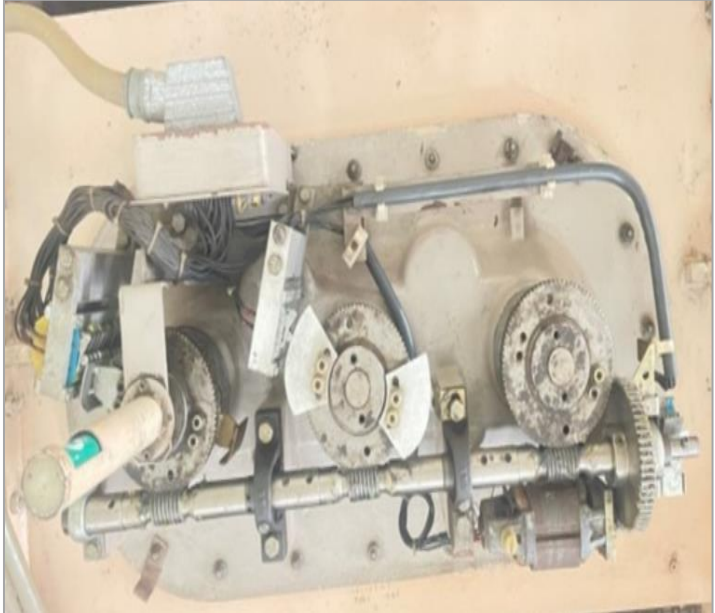
GIS Make & Type: Holec – Indoor GIS





# 66kV SF6 Leakage Repair

|| Past Projects



# 220kV DS/ES Replacement

|| Past Projects

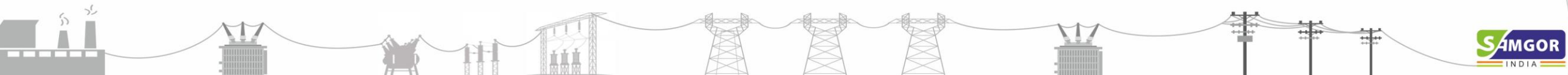
Customer: BGCL

Project: 220kV GIS DS/ES replacement

Project Location: Bhagalpur

Project Duration: 9 Oct to 22 Oct-2023

GIS Make & Type: ABB – Indoor GIS



# 132kV VT Replacement

|| Past Projects

Customer: NLNG / Hitachi Energy

Project: 132kV Bus VT Link Replacement

Project Location: Nigeria


Project Duration: 21 Aug to 29 Aug-2023

GIS Make & Type: ABB – Indoor GIS




# Customer Appreciation

# Past Projects



**एन टी सी  
NTPC**  
Transforming Lives



**एन टी सी लिमिटेड  
NTPC Limited**

[Vk.Mk@Tanda](mailto:Vk.Mk@Tanda)

Dated: 14.12.2022

## Letter of Appreciation

In 420kV GIS of M/s XD Switchgers, Xi'an, China make at NTPC Ltd.-Tanda, flashover had occurred in 660MW, GT#6 bay circuit breaker on 17.01.2022. This bay was out of service for almost one year and circuit breaker replacement work was done through M/s SAMGOR India. This type of work was taken up for the first time across NTPC Ltd. and utmost care had to be taken in dismantling of faulty breaker and replacement with spare breaker. The work required Bus-II shutdown of 12 days and it was decided to carry out the work during Unit#6 overhauling.

M/s SAMGOR India was asked 15 days prior to start of overhauling to make advance visit site to plan the procedure and prepare for required logistics well in advance so that the work may be completed on time and within 02 days time they deputed their engineer at site.

The work of breaker replacement was started from first day of overhauling i.e 01.12.2022 and finished on 11.12.2022 within the stipulated time.

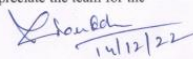
For carrying out the work adequate experience was required and safety was the top priority while execution. Huge mass was to be supported without a fraction of movement of other equipments which could have caused cascaded failure. During the work M/s SAMGOR India supported with all type of testing equipments.

The team involved in the mentioned work consisted of

1. Mr. Punit Kumar Singh
2. Mr. Vikrant Kumar
3. Mr. Sagaylebin Kumar
4. Mr. K Shiva Kumar


The co-ordination among the M/s SAMGOR India team members and with NTPC Ltd. was impeccable. The mentioned team has shown excellent professionalism and maturity in their work which gives NTPC Ltd. confidence to work with M/s SAMGOR India in future for attending critical issues.

The work done by M/s SAMGOR India is really commendable and I appreciate the team for the excellent work done.



Ziauddin  
DGM-EMD

Vk.Mk FkzZy ikoj LVs\*ku] iks% fojqruxj] ftyk% vEcosMdjuxj] m0iz0% 22423:  
Tanda Thermal Power Project, P.O- Vidvat Nagar, Dist- Ambikapur Nagar, U.P-224238  
iathd'r dkcZy;% uVhinhn Hkoj] Ldksi dkEysDj] 7 bLVNv~w'ku; f;h] yks/h jksM] ubZ fnYyh&110003  
Regd.Office: NTPC Bhawan, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi-110003  
Tel: 011-24360100, Fax: 011-24361018/ Website: www.ntpc.co



**MEGHALAYA POWER TRANSMISSION CORPORATION LIMITED**  
OFFICE OF THE EXECUTIVE ENGINEER  
400/220/132KV KILLING (BYRNihat) SUBSTATION  
BARA KILLING, RI BHOI DISTRICT

Dated: Bara Killing, the 22<sup>nd</sup> January 2024

No.MePTCL/EE/KSS/T-22 (P-I) 2023-24/300

To,

SAMGOR India  
Block C, Anand Techno IT Business Park  
Plot No. IT 29/6, Ambad MIDC  
Nr Netwin Infosolutions, Nashik - 422010

Sub: Appreciation for Exceptional Service and Timely Resolution of leakage in our 400 kV Hyosung Make GIS.

Dear Mr. Punit Singh and the SAMGOR India Delhi Team,

I trust this letter finds you well. I am writing to express our sincere appreciation for the outstanding service and prompt response we received from your team regarding the recent maintenance work carried out on our Hyosung Make 400 KV GIS.

Over the past 10 years, we have encountered a total of five leakages in our GIS system. Recognizing the urgency of the situation, we reached out to SAMGOR India, specifically to your team, and were delighted with the efficiency and professionalism demonstrated throughout the process.

Your immediate response and site visit within a week of our initial contact on April 25, 2023, spoke volumes about your commitment to customer satisfaction. Your thorough inspection of the site conditions allowed us to understand the gravity of the situation and make informed decisions promptly.

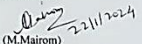
We appreciate your transparent communication and collaboration in confirming the scope of the job, including the necessary consumables such as O-rings of different sizes. Your team's preparedness was evident when you arrived on-site on the agreed-upon date with all the required tools and equipment, ensuring a seamless workflow.

Moreover, your team's dedication, comprising skilled manpower and engineers, was exemplary. They efficiently completed the job within the allotted month, showcasing their expertise and commitment to meeting deadlines without compromising on the quality of work.

We are extremely satisfied with the outcome of the maintenance work performed by SAMGOR India's Delhi team. The professionalism, expertise, and efficiency demonstrated by Mr. Punit Singh and the entire team have exceeded our expectations.


Based on this positive experience, we wholeheartedly recommend SAMGOR India's services for similar projects in the future. Your team's commitment to excellence and customer satisfaction is truly commendable, and we look forward to engaging with SAMGOR India for our future GIS maintenance needs.

Yours faithfully




M. Maitem  
Executive Engineer  
400/220/132 KV Killing (Byrnihat) Substation  
MePTCL, Bara Killing

Executive Engineer  
400/220/132 KV Killing S/s  
MePTCL, Bara Killing



**Sembcorp**  
O&M Services Company LLC

CO REGN NO 1082077  
Tax Card No. 8101822  
P.O.Box 1466, P.C. 211 Salalah  
Sultanate of Oman  
Tel. (968) 23238510/511,  
Fax (968) 23238512  
[www.sembcorpalsalah.com.om](http://www.sembcorpalsalah.com.om)



**sembcorp**

سهم كورب صلالة  
لخدمات التشغيل والصيانة ش.م.م

1082077 : س.م.م  
ص.ب. 1466 الرمز البريدي 211 صلالة  
سلطنة عمان  
هاتف: (968) 23238510/511  
الفاكس: (968) 23238512

Date: 05.06.2023

## TO WHOMSOEVER IT MAY CONCERN

### Work Completion Certificate

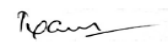
This is to certify that M/s, SAMGOR INDIA has successfully completed the following work:

Description of Work:	SF6 leakage arrest works
Work Order No. & Date:	PO No:4302003941, 20/09/2021
Location:	Sembcorp, Salalah, Oman
Start Date:	07 <sup>th</sup> September 2021
Completion Date:	28 <sup>th</sup> September 2021

The work has been successfully completed by SAMGOR INDIA met and exceeded our expectations, and we are extremely satisfied with the outcome.

We sincerely appreciate SAMGOR INDIA for its valuable contribution, outstanding craftsmanship, and commitment to excellence.

This certificate is issued in recognition of the successful completion of the work mentioned above.



Sayyapureddy Jagan Mohan Rao,  
Senior Maintenance Manager,  
Sembcorp Salalah O&M services Company LLC.





**MINUTES OF MEETING**

DATE: 26/11/2021

MOM held between M/s Samgor India & M/s Techno M/s Power Grid (PGCILgaya 765/400/200 Kv)

Member present :

M/s Samgor India : Punit Singh  
 M/s Techno : SanatBera  
 M/s PGCIL : Surya Prakash, Sr. DGM

Work : 220 Kv GIS maintenance work on the behalf of Xian XD.

- M/S SAMGOR team visited the site on 21 November with the necessary T&P.
- Shutdown started on 22<sup>nd</sup> November around 3:00 PM.
- Gas recovery activity started on 22<sup>nd</sup> November and gas recovery finished around 10pm for all the three compartments.
- Dismantling activity started on 23<sup>rd</sup> November and bellow replacement and re docking finished on same day
- Silica change has been done on 24<sup>th</sup> November
- Vacuuming started on 24<sup>th</sup> November and vacuuming finished till 0.64Mbar
- Gas filling done on 25<sup>th</sup> November
- Gas analysis done with all the values under permissible / acceptable limits
- Leakage test done and no leakage found in the repaired compartment.
- Charging done on 26<sup>th</sup> November 12:10 A.M.

All the repair work carried out to the satisfaction of all including POWERGRID and Techno.

	M/s PGCIL Mr. Surya Prakash Sr. DGM, PGCIL, GAYA	M/s Techno SanatBera Sr. Engg.

**MINUTES OF MEETING ON Dated 08.08.2022 between SAMGOR INDIA, Nashik & POWERGRID, Panvel, Navi Mumbai.**

Members Present

Samgor India	POWERGRID, Navi Mumbai
1) Mr. Dinesh Bhattilak	Mr. Bhandarkar Vaibhav, DGM
2) Mr. Vikrant Kumar	Mr. Anurag Kumar, DGM
3) Mr. Shivkumar	Mrs. Sneha Kolbudhe, Dy. Mgr

Reference – WRTS-I/PADGHE/C&M/BMS/E:514602:2022/NM/BLOA\_ISOLATION OF 1 PH ICT BUSHING/12/DT-06.08.2022.

- As per above referred BLOA, M/s Samgor India Repair & Maintenance team reached at POWERGRID, NAVI MUMBAI 400/220KV GIS PGCIL Substation on 08.08.2022 for isolation of one phase i.e. R-Phase of HV side of bushing of ICT#2 from GIS.
- The link was removed by opening the GIS cover plate. After removing the links, the same were handed over to POWERGRID.
- After proper cleaning done from inside the GIS and the cover plate was again installed properly in presence of POWERGRID.
- Work is completed satisfactorily as per LOA referred above on 08.08.2022.

Samgor India	PGCIL, Navi Mumbai
1) Mr. Dinesh Bhattilak	Mr. Vaibhav Bhandarkar
2) Mr. Vikrant Kumar	Mr. Anurag Kumar
3) Mr. Shivkumar	Mrs. Sneha Kolbudhe, Dy. Mgr

**MOM held between Techno Electric & Engg Co Ltd, Samgor India (Representative of M/s Xian XD, China) and PGCIL at 400kV GIS Chandwa Sub-station on dated 23.08.2023**

Members Present :

<u>For Samgor India</u>	<u>For TEECL</u>	<u>For PGCIL</u>
1. Mr. K. Shiv Kumar (Engg)	1. Mr. D. Mudi (Site in-charge)	1. Satyendra Sharma, Ch. Manager (I/C)
		2. Bijay Kr. Nayak (Engineer)

\* 400kV GIS Chandwa-Latehar Bay (401 & 402) has been charged on 01.10.2022.

\* Y-Pole (Sl.No-YG006749) CB of 400kV GIS Chandwa-Latehar-I (Bay no.401) was breakdown on 27/01/2023 due to Internal Flashover.

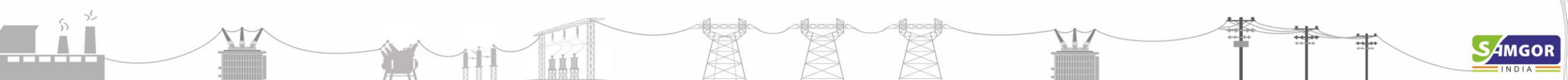
\* M/s Samgor India has been reported at PGCIL Chandwa site on dated 09.07.2023 for replacement of faulty Y-pole CB.

\* M/s Samgor has replaced the Y-pole faulty CB by Mandatory Spare CB (Sl.No-YG007029) and 400kV GIS Chandwa-Latehar line -1 (Bay no.401) has been charged successfully on date 22.08.2023 at 18:37 Hrs.

\* M/s TEECL ensured early supply /replacement of faulty CB pole.

\* As on date spare CB pole is not available at POWERGRID Chandwa site.

For Samgor India (Representative of M/s Xian XD, China) 23/8/23 K. Shiv Kumar	For TEECL 23/8/23 Dhirendu Mudi Site in charge Techno	For PGCIL 23/8/2023 Satyendra Sharma (Ch. Mgr)
--	---	---



# WCC / MOM

# || Past Projects



MOM held between M/S ITPCL, Cuddalore & M/S Samgor India on July 27, 2023 at IL&FS Generation plant Cuddalore site -

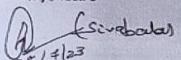
**MEMBERS PRESENT:**

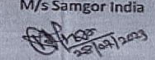
M/s. Samgor	M/s.ITPCL
1. Mr Vikrant Kumar.	1.Mr.K.Balamurugan
	2.Mr.Sivaraman
	3.Mr.Pandiarajan
	4.Mr.Sivabalan
	5.Mr.Yogarajan

Mr Vikrant kumar from M/s samgor India with team and T&P reached at site on 14<sup>th</sup> July 2023 for CT replacement at 400kV GIS in ITPCL.

- On 15<sup>th</sup> July 2023, Line -1 Shutdown taken for CT replacement.
- Equalizing pipe removal, Gas analysis, Initial CRM are carried on 15<sup>th</sup> of July 2023.
- Degassing started on the 16<sup>th</sup> of July .
- Dismantling of CT & tie bus done on 17<sup>th</sup> of July.
- New CT replaced and vacuuming started 18<sup>th</sup> of July.
- Desiccant replacement, Vacuuming and gas filling was completed on 22<sup>th</sup> July. After 24 Hrs of filling Gas analysing checked and report submitted. Gas recovery and filling report to be submitted.
- HV & PD test completed on 25<sup>th</sup> July and reports found ok & detailed report to be submitted.
- Replaced equipment & its bays are charged successfully on 26<sup>th</sup> July 2023.
- Balance unutilized consumables are taken back by M/s. Samgor.
- Mr Vikrant leaving with team and T&P from the site on the 28<sup>th</sup> of July.

All the work related to the replacement of CT was completed successfully within the defined shutdown plan .

M/S IL&FS  
  
 28/7/23  
 Mr. Sivaraman  
 28/7/2023

M/s Samgor India  
  
 28/07/2023

**Minutes of Meeting**

Date: 28-Oct-2023

**MOM between M/s KEI Industries Limited, New Delhi and M/s Samgor India, Nashik at NHPC Uri site on 28-Oct-2023.**

**P.O Ref No. W-KEI/NHPC 400kV URI/EHV/WO/ SAMGOR/23-24/02 Dated. 21.04.2023**

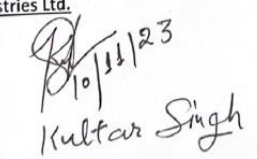
M/s Samgor India Service Cart, Gas Analyzer & Tools & Consumables was reached at NHPC Uri Site on 19-Sept-2023 & M/s Samgor India Team reached NHPC Uri site for Cable termination work on indoor portion of 400kV ABB/Hitachi Make GIS on 25-Sept-2023.


The work was successfully completed on 20-Oct-2023.

All the work has been completed satisfactorily as per the instructions of ABB/Hitachi and in the presence of representatives of M/s KEI.

All Samgor India tools and equipment dispatched from site on 25-Oct-2023. Samgor India team will leave the site and guest house on 28-Oct-2023

**Notes:** A total of 50 kg of New SF6 gas is used at site.

M/s KEI Industries Ltd.  
  
 28/10/23  
 Kultar Singh

M/s Samgor India  


MOM between M/s PGCIL, CHANDWA & M/s Samgor India on August 28, 2023.PO Ref.no.-5100038686.

**MEMBERS PRESENT:**

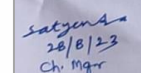
For PGCIL	For SAMGOR INDIA
1. Mr Satyendra Sharma ,Ch.Manager	1. Mr. Shiva Kumar
2.Bijay Kr.Nayak,Engineer	
3.Tarun Prajapati,Jr.Engineer	

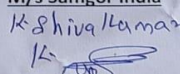
M/s Samgor India Mr. Shiva Kumar and (03 Staffs)visited POWERGRID Chandwa site for SF6 gas leakage work on outdoor portion of 400kV Chandwa-Ranch-I (Bay No.-410)compartment no. DG-7 /R-ph of Hyosung make 400kV GIS on 15<sup>th</sup> August -2023.

- Rectification plan of the bus duct submitted on 16<sup>th</sup> August-2023.
- After the shutdown of 400kV Chandwa-Ranchi-I on 18<sup>th</sup> August-2023.
- Recovery and pre-dismantling process completed on 18<sup>th</sup> August-2023.
- R-phase leakage has been attended by replacing,O-Ring (Spares from M/s Hyosung) and other consumables (List Enclosed) supplied by M/s Samgor India,Materials received at POWERGRID Site on 08/07/2023.
- After rectification all pre-charging checks were completed on 20<sup>th</sup> August-202.
- 400kV Ranchi-Chandwa -I , charged on 21/08/2023 at 23:14 Hrs.

The M/s Samgor India team exhibited remarkable efficiency within the given time constraints.

The meeting concluded on a positive note, with all parties expressing satisfaction .

M/s PGCIL  
  
 28/8/23  
 Ch. Mgr

M/s Samgor India  
  
 28/8/2023

Prajapati  
 28.10.2023  
 chandwa 3/s

28/10/2023  
 ENGR/CHANDWA



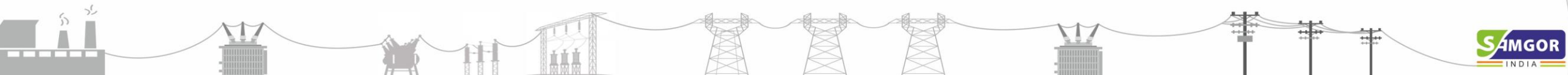
### Preventive Maintenance plan for Gas Insulated Substations

Voltage class	420kV						
Site Location	Tanda, UP						
Customer	NTPC						
Sr	Type of Activity	Equipments used	Shutdown	Quarterly#	Half-Yearly	Annually	
1	SF6 Gas analysis	SF6 Multi-Analyzer (% , DewPt, SO2), with auto pumpback function	NO	YES	YES	YES	
2	Leak monitoring	Precision temperature compensated density gauge	NO	YES	YES	--	
3	Leak checking	LeakSpy (with ppm measurement)	NO	--	YES	YES	
4	Gas filtration / replacement	DILO Service cart Storage tanks SF6 Multi-Analyzer	YES	--	--	YES	
5	Gas density monitor checking	Precision temperature compensated density gauge	YES	--	--	YES	
6	Checking & Maintenance of Operating mechanism of CB/DS/ES	Timer, Clamp-meter, Multimeter Tool set	YES	--	--	YES	
7	Contact Resistance checking	CRM200 Multimeter	YES	--	--	YES	
8	Partial Discharge testing <sup>1</sup>	PD test system	NO	--	YES	YES	
9	CO2 cleaning of GIS and panels	High pressure compressor CO2 pellet making machine, CO2 blaster	YES	--	--	YES	
10	Grease injection in flanges	Grease injection pump & Special grease	YES			YES	
11	Gas-Drying Molecular Sieve changing	DILO Service cart SF6 Multi-Analyzer Molecular Sieve	YES			YES	
			SHUTDOWN DAYS	NO	NO	10	
			ANTICIPATED TOTAL WORK-DAYS	10	10	10	
#	Quarterly cycle is only for the 1st year to establish base-data parameters for proper resolution in half-yearly and annual cycles						
1	PD testing for Annual cycle is in Online mode, so will begin prior to shutdown, and be again verified after maintenance work post-shutdown						





SMIL Manesar Trafo testing plan			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Materials Required	
Sr		Activity Description	Shutdown?							
1	TRAFO 1	Gas Recovery, 6 compartments	YES	4 hrs					Addnl Filter unit	
2		Compartment disassembly, 3 compartments, link opening	YES	9 hrs					IP, Tissues, Grease etc	
3		Trafo testing (C&TD, Ratio, Balance, WR, IR etc)	YES	3 hrs						
4		Link Installation, compartment closing, 3 compartments	YES		9 hrs				Molecular Sieve - 2 kgs	
5		Vacuuming & SF6 Filling, Gas Analysis	YES		15 hrs					
6	TRAFO 2	Gas Recovery, 6 compartments	YES		4 hrs					
7		Compartment disassembly, 3 compartments, link opening	YES		9 hrs				IP, Tissues, Grease etc	
8		Trafo testing (C&TD, Ratio, Balance, WR, IR etc)	YES		3 hrs					
9		Link Installation, compartment closing, 3 compartments	YES			9 hrs			Molecular Sieve - 2 kgs	
10		Vacuuming & SF6 Filling, Gas Analysis	YES			15 hrs				
11	TRAFO 3	Gas Recovery, 6 compartments	NO				4 hrs			
12		Compartment disassembly, 3 compartments, link opening	NO				9 hrs		IP, Tissues, Grease etc	
13		Trafo testing (C&TD, Ratio, Balance, WR, IR etc)	NO				3 hrs			
14		Link Installation, compartment closing, 3 compartments	NO					9 hrs	Molecular Sieve - 2 kgs	
15		Vacuuming & SF6 Filling, Gas Analysis	NO					15 hrs		
Sr		Equipments required							Scope	
1		Tools / Tackles		x	x	x	x	x	Samgor	
2		Scaffolding		x	x	x	x	x	SMIL	
3		SF6 Service cart		x	x	x	x	x	Samgor	
4		Vacuum machine + manifold		x	x	x	x	x	Samgor	
5		SF6 Gas Analyzer		x	x	x	x	x	Samgor	
6		Omicron Tetrano + TD1		x	x	x	x	x	Samgor	
7		Farana / Crane		x	x	x	x	x	SMIL	
Sr		Human Resources required							Scope	
1		Project Manager		1	1	1	1	1	1	Samgor
2		Mechanical Supervisor		1	1	1	1	1	1	Samgor
3		Electrical Supervisor		0	0	0	0	0	0	Samgor
4		Skilled Fitters		3	3	3	3	3	3	Samgor
5		Skilled Welder		0	0	0	0	0	0	Samgor
6		Testing Engineer		1	1	1	1	1	1	Samgor
7		Labors		2	2	2	2	2	2	Samgor







*Thank you for your  
attention...!!*

India Office:

Block C, Anand Techno IT Park, Ambad MIDC,  
Nashik - 422 010, Maharashtra, India.

[info@samgor.in](mailto:info@samgor.in)

[www.samgor.in](http://www.samgor.in)

UAE Office:

PO Box 108579, Al Ghait Tower, Hamdan  
Street, Abu Dhabi, UAE.

[info@samgor.me](mailto:info@samgor.me)

[www.samgor.me](http://www.samgor.me)

