

TOSHIBA

COMPANY PROFILE

TOSHIBA TRANSMISSION & DISTRIBUTION SYSTEMS (VIETNAM) LTD.

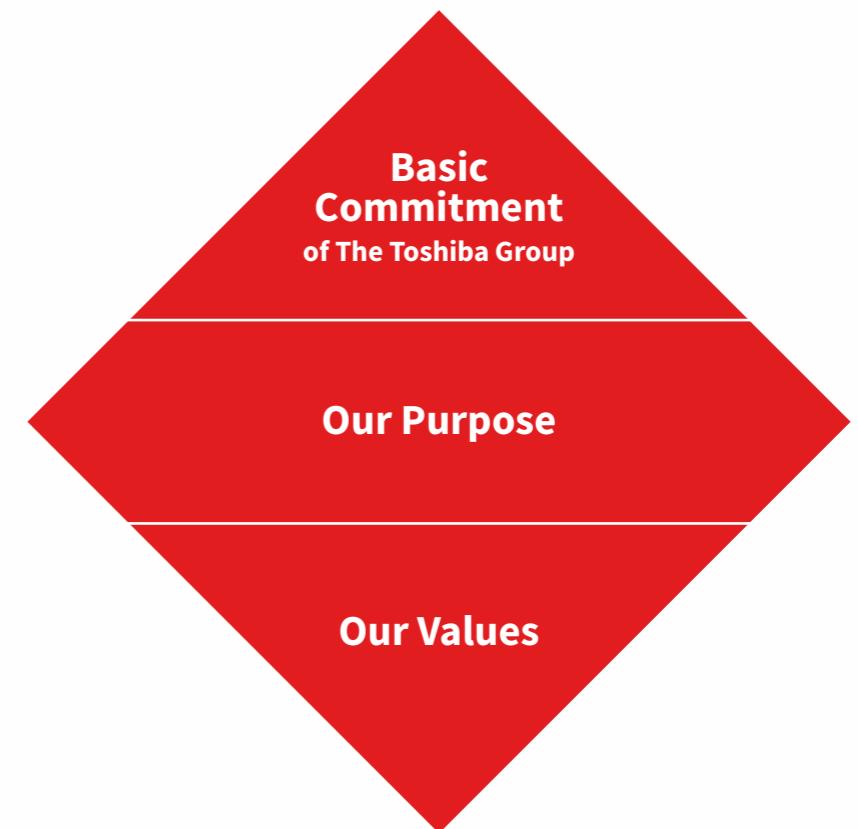




THE ESSENCE OF TOSHIBA

The Essence of Toshiba is the basis for the sustainable growth of The Toshiba Group and the foundation of all corporate activities.

It has three components: Basic Commitment of The Toshiba Group, Our Purpose, and Our Values.



Basic Commitment Of The Toshiba Group **Committed to People, Committed to the Future.**

At Toshiba, we commit to raising the quality of life for the people around the world, ensuring progress that is in harmony with our planet.

Our Purpose
We turn on the promise of a new day.

Our Values
Do the right thing.
Look for a better way.
Always consider the impact.
Create together.

MESSAGES FROM GENERAL DIRECTOR

Since entering the Vietnamese market in July 2008 with the mission to become a leader in the field of energy and power production, Toshiba Transmission & Distribution Systems (Vietnam) Ltd. - TTDV has continuously worked to affirm its position among both domestic and foreign customers. Our business strategies at TTDV are aligned with Toshiba Group's core commitment: "Committed to People, Committed to the Future". We consistently strive to deliver the best products and services to our clients in Vietnam and worldwide. In addition to our customers, we place great importance on our workforce, as we recognize that "Human resources are the key to creating value and driving business success". We are committed to maintaining a friendly, safe, professional, and inclusive working environment for all.

Mr. Mitsuaki Mizunoue

GENERAL DIRECTOR

Toshiba Transmission & Distribution Systems (Vietnam) Ltd. - TTDV

LOCATIONS

TTDV's Head Office



TTDV's HCM Office



Beside the head quarter, after 8 years of operation, in 2016, TTDV developed and established a representative office in the center of Ho Chi Minh City. The office is an extended arm, supporting TTDV to work with customers in the Southern region.



TTDV's Factory

TTDV's headquarter and factory is located in a big area of nearly four thousand square meters in Thang Long Industrial Park, Dong Anh, Hanoi, Vietnam.



TTDV's Hanoi Office

In 2021, TTDV continues to affirm its capabilities by developing a new business segment - maintenance and servicing of generators at power plants in Vietnam. A representative office in Hanoi city was established to support the implementation of this new business segment.

2023
-2024

- FEBRUARY-2023** Established a strong market presence by hitting the delivery of 30,000 IED units
- JUNE-2023** Handle Vung Ang 1 Unit 1 Recovery
- JULY-2024** Energization of first digital substation in India (Parel Substation of TATA Power)

2020
-2022

- JANUARY-2020** Official registration into relay vendor list of TNB-Malaysia
- MARCH-2021** Establish an operation of Power Systems Business Division (PS)
- JUNE - 2021** Official registration into Abu Dhabi Transmission and Dispatch Company (TRANSCO)'s vendor list for protection relays.
- NOVEMBER-2022** Handle TOSMAP HMI system upgrade for Vung Ang 1

2015
-2019

- OCTOBER-2015** Move to the new factory (facility Expansion).
- APRIL-2016** Open a Representative Office In Ho Chi Minh
- Successfully executed comprehensive engineering system for a 400kV Substation Automation System in Oman
- OCTOBER-2015** Official registration into relay vendor list of EGAT-Thailand

2012
-2014

- JULY-2012** Start manufacturing GR-200 relays (New generation)
- JULY-2013** First Contract of 220kV Transformer (NPMB, Vietnam)

2008
-2011

- JUNE-2008** Get the business license.
- DECEMBER-2008** Finish construction of the factory
- AUGUST-2009** First Contract of TTDV's Protection relays
- OCTOBER-2010** First Overseas Contract To Taiwan

TTDV has intensive experiences in the following core businesses:

- TTDV inherits over 100 years experiences of Toshiba - Japan in manufacturing of Toshiba Protection & Control (P&C) product for both domestic and international markets.
- We specialize in designing, configuring, and integrating Substation Automation Systems (SAS). TTDV has successfully implemented over 60 SAS substations worldwide.
- Supplying T&D products & systems manufactured by Toshiba global manufacturing network such as Transformer, Surge Arrestor...for Vietnam's market.
- Maintenance & various engineering services for Power Plants supplied by Toshiba

TYPICAL PROJECTS OF TTDV

NO	PROJECT NAME	YEAR	SCOPE OF SUPPLY	PROJECT INFORMATION
1	110kV Parel GIS Substation	2024	Conventional & Digital Protection relays (GRL200, GRT200, GRD200, GRB200)	- End - User: TATA Power - India - The first digital Substation supplied by Toshiba Vietnam co-operating with Toshiba India (TTDI) - Toshiba India: Supplying GIS system.
2	500kV Vinh Yen Substation	2024	Supply 6 sets of 500kV-300MVA transformer	- Customer & End-user: EVNNPT - Vietnam - Project name: 500kV Vinh Yen substation and connection
3	110kV Bac Tien Phong GIS Substation	2024	Supply 110kV GIS equipment	- Customer & End-user: Bac Tien Phong Industrial Zone JSC. - Project name: Bac Tien Phong substation
4	Vinh Tan 4 Unit 3 TPP	2024	Spare parts and TA services	- End-user: Vinh Tan 4 TPP / EVN - Project name: Supply spare parts and TA services for Vinh Tan 4 Unit 3 outage
5	Vung Ang 1 Unit 2 TPP	2024	Spare parts and TA services	- End-user: Vung Ang 1 TPP / PVP - Project name: Supply spare parts and TA services for Vung Ang 1 Unit 2 outage
6	Thai Binh 2 Unit 1 TPP	2024	TA services	- End-user: Thai Binh 2 TPP / PVPGB - Project name: Supply TA services for Thai Binh 2 Unit 1 bearing inspection
7	Van Phong 1 Unit 1 TPP	2024	Spare parts and TA services	- End-user: Van Phong 1 TPP / VPCL - Project name: Supply spare parts and TA services for Van Phong 1 Unit 1 outage
8	220kV Tao Dan GIS Substation	2023	Supply 220kV GIS equipment	- Customer & End-user: EVNNPT - Vietnam - Project name: Tao Dan - Tan Cang 220kV underground cable
9	Vung Ang 1 Unit 1 TPP	2023	Vibration engineering services	- End-user: Vung Ang 1 TPP / PVP - Project name: Supply vibration engineering services for Vung Ang 1 Unit 1
10	Vung Ang 1 Unit 1 TPP	2023	TA services	- End-user: Vung Ang 1 TPP / PVP - Project name: Supply TA services for unit restoration after incident of Vung Ang 1 Unit 1
11	500kV Nha Be substation	2022	Supply 6 sets of 500kV-300MVA transformer	- Customer & End-user: EVNNPT - Vietnam - Project name: Power enhancement for 500kV Nha Be and O Mon substations
12	Vung Ang 1 Unit 1 TPP	2022	Vung Ang 1 Unit 1 outage spare parts and TA services	- End-user: Vung Ang 1 TPP / PVP - Project name: Supply spare parts and TA services for Vung Ang 1 Unit 1 outage
13	Vung Ang 1 TPP	2022	Vung Ang 1 Unit 1/2 HMI upgrade	- End-user: Vung Ang 1 TPP / PVP - Project name: Upgrade HMI system for Toshiba turbine/generator control system for Vung Ang 1 Unit 1/2
14	Vinh Tan 4 Unit 1 TPP	2022	Spare parts, TA and engineering services	- End-user: Vinh Tan 4 TPP / EVN - Project name: Supply spare parts, TA and engineering services for Vinh Tan 4 Unit 1 outage
15	110kV DEEP C GIS Substation	2021	Supply power transformer and 110kV GIS equipment	- Customer & End-user: DEEP C Green Energy - Project name: DEEP C II 110kV substation project
16	500kV Pleiku, 220kV Hue, 220kV Bao Loc Substations	2021	Upgrade conventional substations to computerized substations	- Customer & End-user: EVNNPT - Vietnam - Project name: Upgrade protection and control systems of 500kv and 220kV substations in Central Vietnam
17	500kV Ea Sup Substation	2020	Supply 6 units of 500kV-200MVA, 3 units of 110kV-110MVA, 4 units 110kV-80MVA transformer	- Customer & End-user: Xuan Thien group - Project name: Ea Sup Solar Power plant
18	220kV Thanh Nghi Substation	2019	Transformer, Primary equipment, and Control and Protection system	- Customer & End-user: EVNNPT - Vietnam - The first project supplying full equipment of a substation
19	220kV Mai Dong Substation	2018	Upgrade old computerized system to Toshiba computerized system	- Customer & End-user: EVNNPT - Vietnam - The first SAS upgrading project from the old of other vendor
20	500kV Tanjung Jati 5&6 Substation	2017	Supplied comprehensive system including: Protection relays, Bay Control Unit, Substation Automation System & Site Commissioning Service	- Project info:Tanjung Jati B coal-fired power plant Units 5 & 6 Expansion Project (2,000MW) commences in Indonesia
21	110kV Thach Linh	2017	Engineering, Procurement, and Construction for Control and Protection system	- Customer & End-user: EVNNPC - Vietnam - The first P&C EPC project
22	500kV Lai Chau Substation	2016	Control and Protection system including Computerized system	- Customer & End-user: EVNNPT - Vietnam - The first 500kV substation P&C project
23	400kV Sur & 400kV Jahloot Substation	2014	SAS Engineering Service	- End-user: OETC - Oman - The first oversea SAS project
24	220kV Kim Dong & 220kV Hai Duong 2 Substation	2013	Transformer and Control and Protection system	- Customer & End-user: EVNNPT - Vietnam - The first projects supplying transformer and P&C system
25	220kV Tra Vinh	2012	Control and Protection system including Computerized system	- Customer & End-user: EVNNPT - Vietnam - The first P&C project

TTDV'S BUSINESS & PRODUCTS

DISTRIBUTION SYSTEMS

Toshiba has been providing highly reliable switchgear since starting production of metal-clad enclosed switchgear cubicle in 1926, and has continued to develop many products for a wide range of applications. Furthermore, since developing the first vacuum circuit breaker, Toshiba has continued to accumulate expertise in vacuum switch technology building a reputation as a leading company in the production of vacuum components. Along with these technologies, Toshiba is developing products that are not only highly reliable, but are made with recyclable materials and have a low environment impact.

01

HIGHT VOLTAGE SWITCHGEARS

Provide both GIS and AIS system with compact and sophisticated design, but robust enough to survive in the most hostile environment which are being used everywhere from mountainous sites to congested metropolitan areas.

02

SURGE ARRESTERS

For over 100 years Toshiba has continuously endeavored to improve surge arrester technology and product quality, and has achieved positive results in manufacturing and employing the world beating techniques. Toshiba provides various type of surge arrester for both substation and transmission line application and wide range of voltage level.

04**03**

POWER TRANSFORMER

To deal with the growing demand of electric power and various requirements, Toshiba has been upgrading transformer capacity and its voltage with the latest technology, and has developed gas insulated transformer (GIT) and advanced site assembly transformer (ASA). The reliability of Toshiba's transformer with excellent technology and high-quality fabrication is highly appreciated all over the world. The transformer manufactured by Toshiba has a maximum capacity of 1500 MVA and a maximum voltage of 1050kV.

POWER SYSTEM BUSINESS

With 12 coal fired power generating Units supplied by Toshiba, expectedly we handles 3 to 4 outages every year. Our technical services include equipment life expectancy and upgrade assessment, troubleshooting, root cause analysis, and all other engineering services related to Toshiba supplied system.

In the global trend of digitalization, the needs to manage plant performance, optimize its operation, reduce NOx and CO2 emission are higher than ever before. We offer Toshiba's EtaPRO and other IoT solutions to help Customers achieve the ultimate goals. With 30 years of research and development, EtaPRO has been deployed in over 60 countries, more than 3,000 power units with total design capacity of over 815,000 MegaWatt.

06**05**

PROTECTION & CONTROL SYSTEMS

Toshiba provides complete solutions for protection, control and automation of power networks at all transmission and distribution voltage levels. Our innovative designs and state-of-the-art technology give you cost-effective and user-friendly products, while our high-quality manufacturing facilities guarantee years of reliable and maintenance-free service.

07

FTK/TK PROJECTS

Toshiba has supplied a wide range of Full Turn Key (FTK) and Turn Key (TK) substations to clients all over the world. Quality is your assurance as Toshiba FTK project teams are accredited through the internationally recognized quality assurance standard of ISO9001 which cover key management processes such as procurement control, design of substation systems, project schedule control, site coordination, and commissioning works.

08

PROTECTION & CONTROL SYSTEMS

TTDV provides complete solutions for protection, control and automation of power networks at all transmission and distribution voltage levels. Toshiba innovative designs provide cost-effective and user-friendly products, while our high-quality manufacturing facilities guarantee years of reliable and maintenance-free service.



GR-200 IED

GR-200 SERIES

The GR-200 Series is a state-of-the-art protection and control IED platform, combining high quality relay design with the latest in digital substation technology. This flexible and powerful platform will satisfy all of your protection and control requirements, while its user-friendly software tool, GR-TIEMS, ensures a smooth engineering process.



GR-200 Compact IED

GR-200 COMPACT SERIES

The GR-200 Compact Series is the new multi-function protection and control IED generation designed for a wide range of applications from MV through HV/EHV Network. It features comprehensive range of protection and control functions, multiple communication protocol, and come with compact size and effective cost.



GRE IED

GRE SERIES

The GRE-Series multi-function protection IED have been designed specifically for application in MV networks. These compact, cost-effective devices provide a comprehensive range of protection and control functions, supported by the easy-to-use RSM100 software package.

SUBSTATION AUTOMATION SYSTEM (SAS) GSC1000

GSC1000 is today's state-of-the-art system and all of the main components have been certified by DNV-GL to demonstrate compliance with the IEC 61850 standard for substation communications. GSC1000 is configured in a bay oriented and distributed system architecture, its components are modular and facilitate easy upgrading to the latest device models.

TTDV engineers have rich experiences in SAS engineering for Vietnam and global markets.

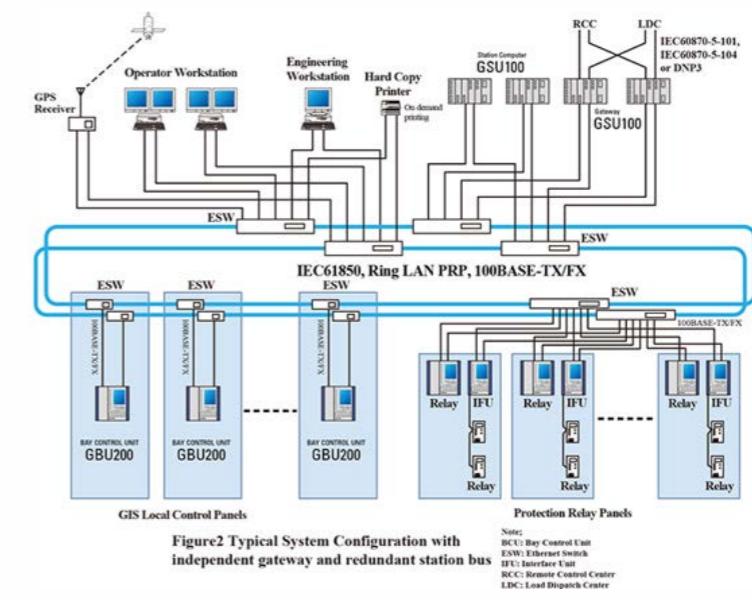


Figure2 Typical System Configuration with independent gateway and redundant station bus

GSC1000 Substation Automation System

DIGITAL SUBSTATION - CONCEPT

The digital transformation of electrical power systems has been driven mainly by three mega-factors: carbon neutral initiatives (reducing overall carbon emissions), decentralization of energy generation (locally generated clean energy to meet local demand), and digitalization (adoption of digital technology to increase cost efficiency and system integrity). This digital transformation is also applied to substation systems through the introduction of digital substations with new process bus technology.



DIGITAL SUBSTATION - PROCESS BUS SOLUTION

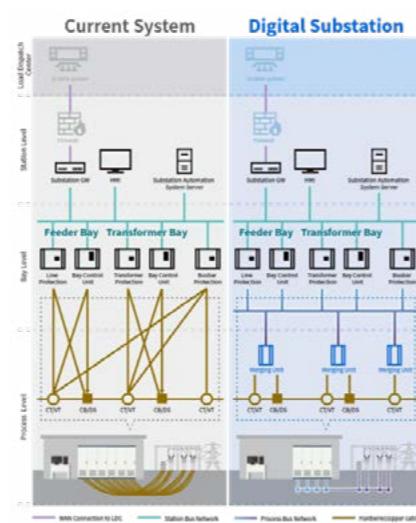
The process bus solution is implemented by introducing new equipment called Merging Units (MU) near the primary equipment in the switchyard. The merging unit reads the output values of the instrument transformers, converts to digital signals and sends to the secondary equipment (BCU, protection relays) via sampled values (SV) over Ethenet-based connection.

This approach reduces the reliance on external hardware such as hardwired connections between IED and instrument transformer. Process bus technology is developed in compliance with substation communication international standard IEC 61850-9-2, which ensures interoperability between primary and secondary equipment for easy and flexible system upgrade and extension.

Toshiba GR-200 Series protection and control devices now support both station bus server and process bus client functionality, and are fully compatible with IEC 61850-8-1 GOOSE & MMS as well as IEC 61850-9-2 Sample Value.



Merging Unit - GMU200



Conventional SAS
vs Digital Substation

ENGINEERING SERVICES

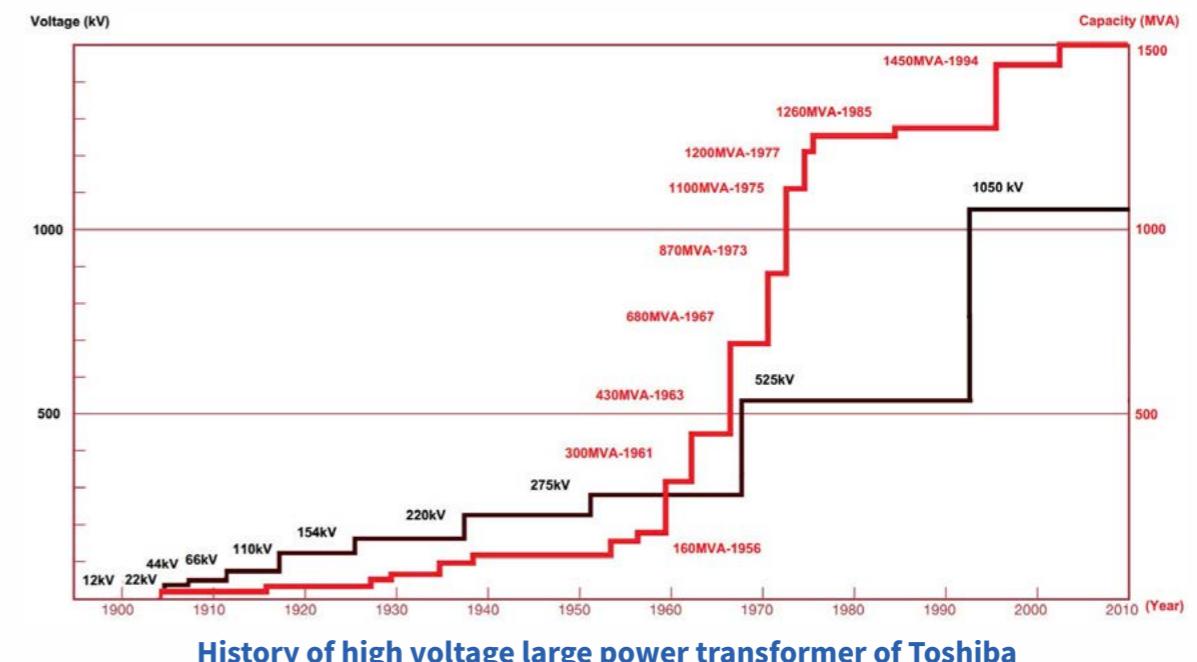
We has a wide range of engineering services besides products to provide to customers:

- 24/7 after-sales service for protection relays and SAS.
- Training course on SAS and protection relays from basic to advanced.
- Solution consulting for Protection and Control systems.

POWER TRANSFORMER

For more than a century, Toshiba transformer have been occupying a significant role in the remake development of electricity business, and renewing the history of high voltage and large power records.

From Toshiba's technology and extensive experience over the past hundred years, we are confident that we can provide customers with the best quality products, along with flexible customization according to different requirements of customers.



History of high voltage large power transformer of Toshiba

GAS INSULATED TRANSFORMER (GITS)

Gas Insulated Transformer (GITS) instead of Oil Immersed Transformer (OITs) offer the best solution for overcoming the sharp increase in electric power demand in large cities.

With excellent features of GIT as below:

- Non-flammability
- Non-explosive feature
- Compactness, capable of placing underground or tunneling
- Excellent interface with GIS
- No oil leakage, no environmental pollution



OITs



GITs

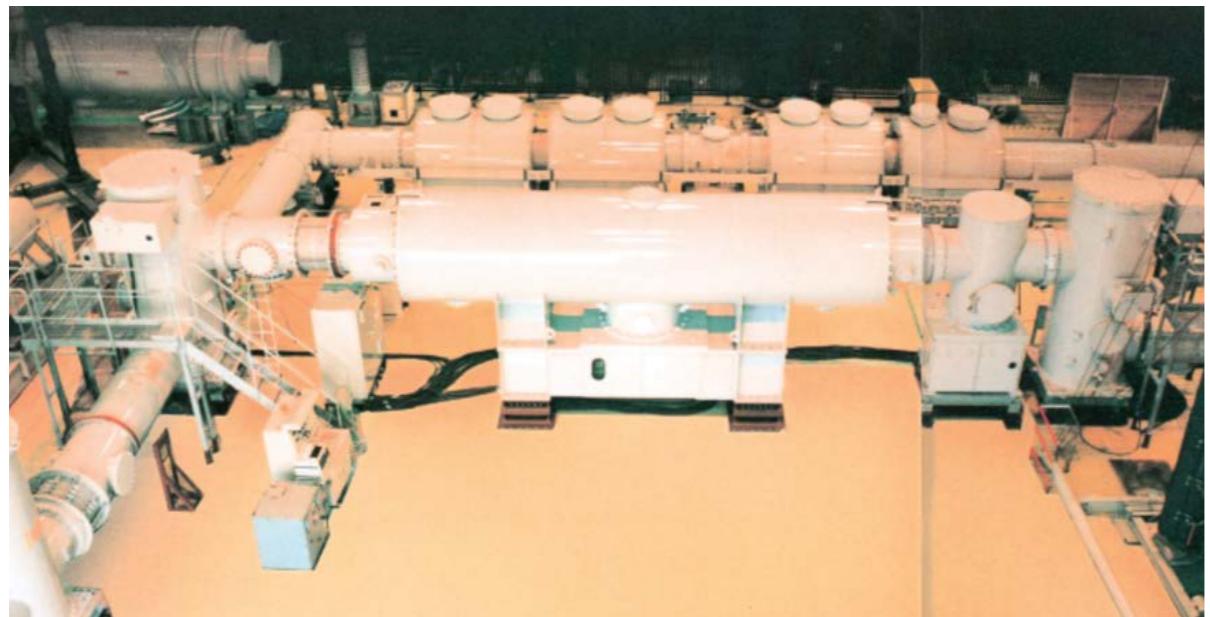
GAS INSULATED SWITCHGEAR

Toshiba gas insulated switchgear (GIS) is accepted world wide as state-of-the art equipment with many superior features.

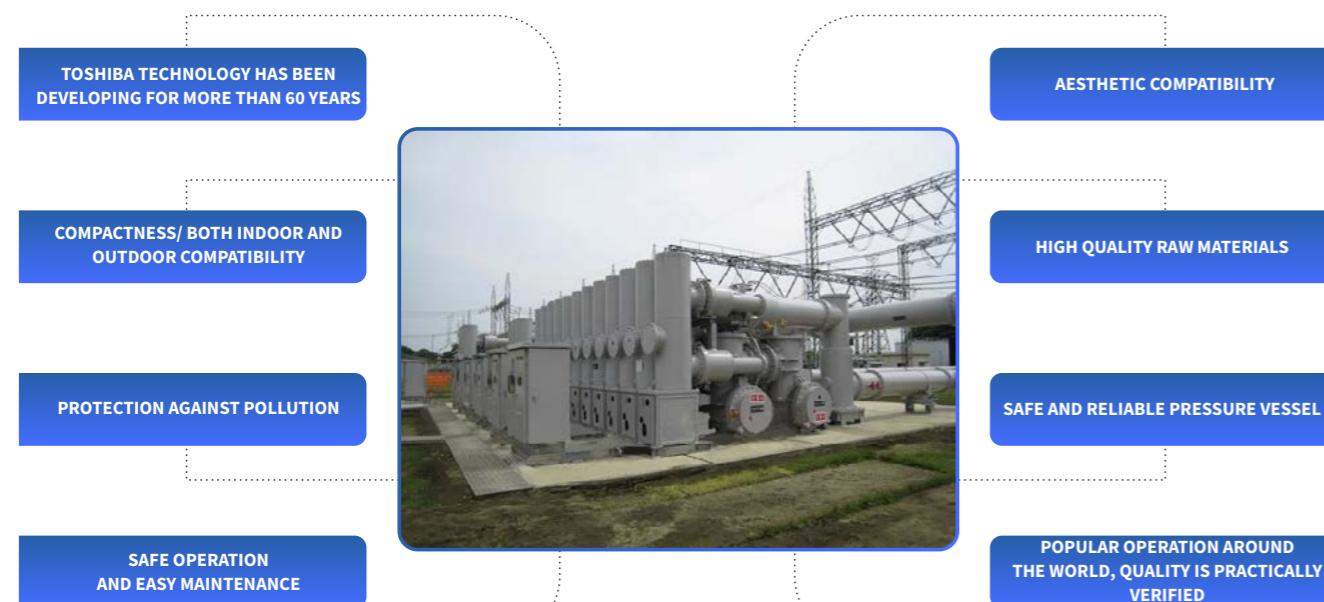
Since the delivery of the first unit in 1969, Toshiba has supplied GIS, globally more than 1,000 stations with over 5,000 units covering voltage from 72.5kV to 1,100kV and subject to various environmental conditions.

All these installations continue to provide trouble free, reliable service in network operation.

Toshiba has developed UHV GIS 1,100kV, the highest voltage in the world.



1,100kV GIS Equipment



LIGHTNING ARRESTERS

For more than 100 years, Toshiba has been working on the innovation of LA technology and the improvement of product quality. Toshiba has successfully established the world leading position in this field. We can produce various Las with high reliability and excellent performance for customer. Our product line cover all voltage grades up to 1,100kV.

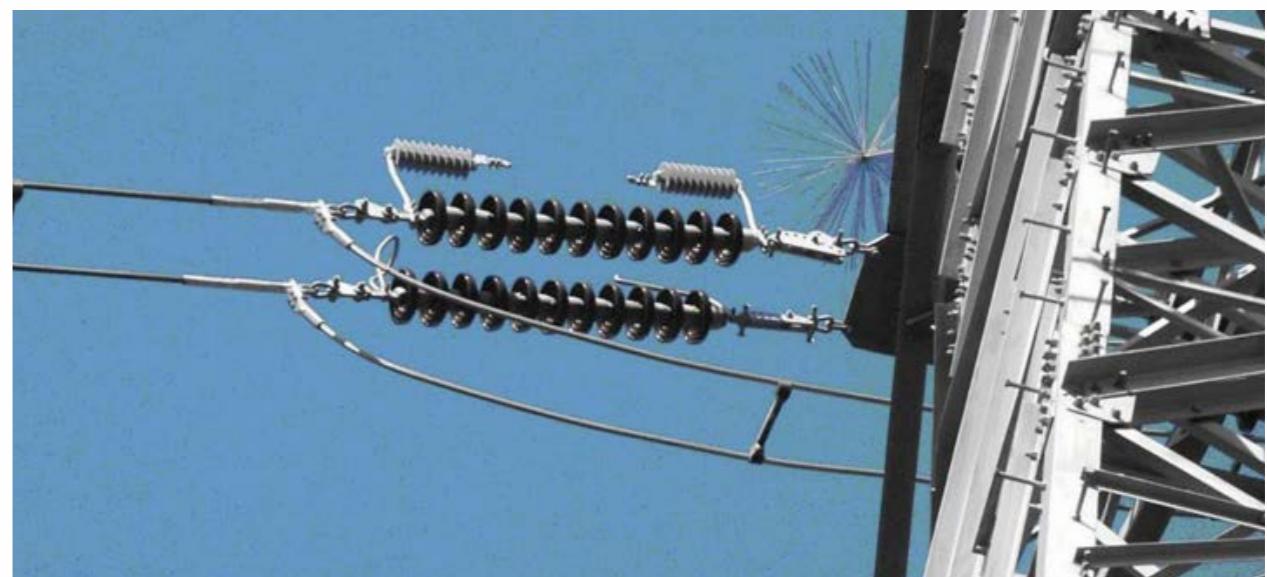


EXTERNALLY GAPPED LINE ARRESTERS

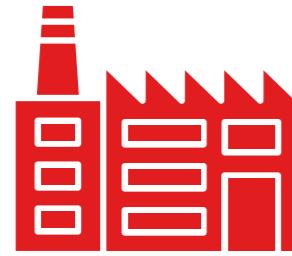
SMART SOLUTION FOR STATE POWER SUPPLY

The transmission line arrester is the optimal method of lightning protection. Toshiba can offer a much smarter lightning protection solution; namely a transmission line arrester with an external series gap, otherwise known as an Externally Gapped Line Arrester (EGLA).

EGLAs can help eliminate not only lightning damages of transmission line equipment but also slight power interruptions after trip-outs.



POWER SYSTEM

**SPARE PARTS**

Spare parts for Thermal and Hydro Plants

01

SERVICE

Troubleshooting, Implementing solutions, and providing Engineering Service

02

UPGRADE

Provide Life Expectancy Assessment and Equipment Upgrade

03

TECHNICAL ADVISOR (TA)

TA support reliable Repair, Assembly and Commissioning work

04

ASSET MANAGEMENT

Improving Asset Efficiency using Digital Solution, EtaPRO™

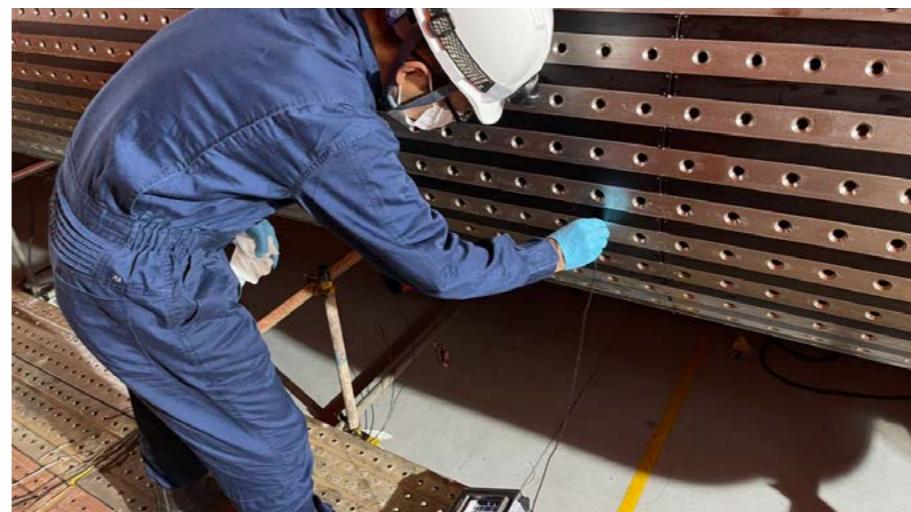
05



Rotor inspection



Clearance check before Rotor lifting up



UT for rotor wedges

SPARE PARTS AND TECHNICAL ADVISOR

Based on the plant outage planning, we coordinate and support Customers preparing necessary Spare Parts and arranging Technical Advisor required to ensure the outage is carried out according to plan, safely and with quality assurance.

With 12 coal fired power generating Units supplied by Toshiba, expectedly we handles 3 to 4 outages every year.

PLANT UPGRADE AND OTHER TURN-KEY SERVICE

Our technical services include equipment life expectancy and upgrade assessment, troubleshooting, root cause analysis, and all other engineering services related to Toshiba supplied system.

In 2023, with the support from Toshiba team in Japan, we advised and supported the recovery of Vung Ang 1 Unit 1 Thermal Power Plant after more than a year of shutdown due to an incident.

DIGITAL SOLUTIONS FOR PLANT, EtaPRO™

In the global trend of digitalization, the needs to manage plant performance, optimize its operation, reduce NOx and CO2 emission are higher than ever before. We offer Toshiba's EtaPRO and other IoT solutions to help Customers achieve the ultimate goals.

With 30 years of research and development, EtaPRO has been deployed in over 60 countries, more than 3,000 power units with total design capacity of over 815,000 MegaWatt.



IED Manufacturing Factory



500kV GIS Switchyard - Tanjung Jati, Indonesia



Toshiba's GIS System at Deep C Hai Phong, Vietnam



Site Work



Training for PLN Indonesia at PLN's Facility

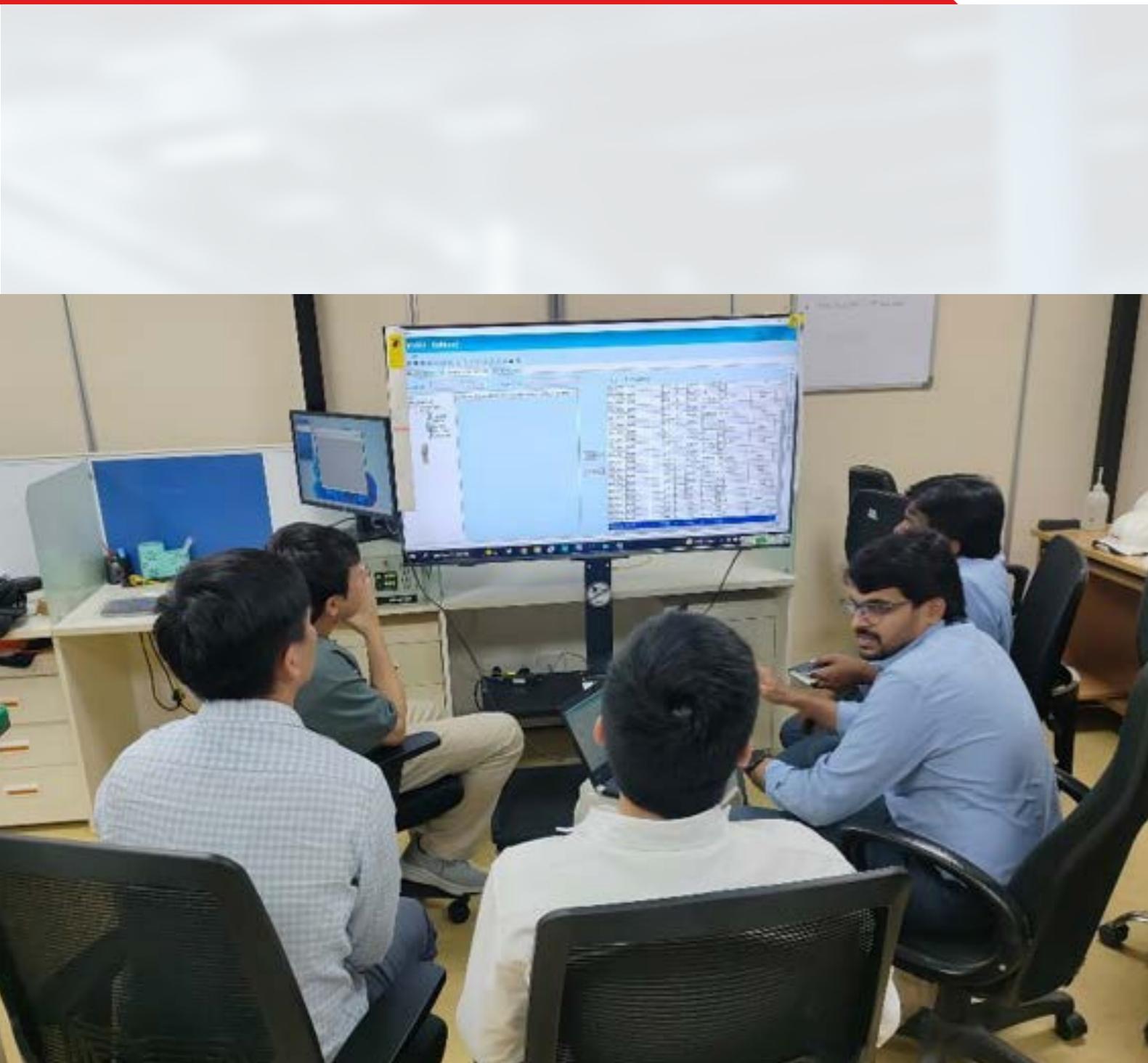
Training for SESB Malaysia at SESB's Office



Training for SESB Malaysia at SESB's Office



Customer Training



Support Toshiba India (TTDI) at TTDI's factory



Support EVN at 220kV Thanh Nghi Substation



Customer Support

POWER SYSTEM



7 Thermal Power Plants: **12** units



3 Hydro Power Plants: **8** units



Service Capacity: **>8.000 MW**

GENERATION

PRIMARY EQUIPMENT



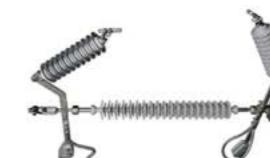
Power Transformer: Total capacity **>25.000** MVA



GIS: **>40** bays



SA: **>4.500** sets



EGLA: **>3.500** sets



IED: **>35.000** units



Substation Automation System (SAS): **>60** systems

PROTECTION & CONTROL

Continent: **5**
Country: **>40**



IED: **>22.000** units
SAS: **>20** systems

TRANSMISSION



- ISO 9001:2015
- ISO14001:2015
- ISO 45001-2018
- THIRD PARTY LAB TEST (SG-EPRI, UKAS, JIC, DNVGL (KEMA))...



ISO 9001:2015

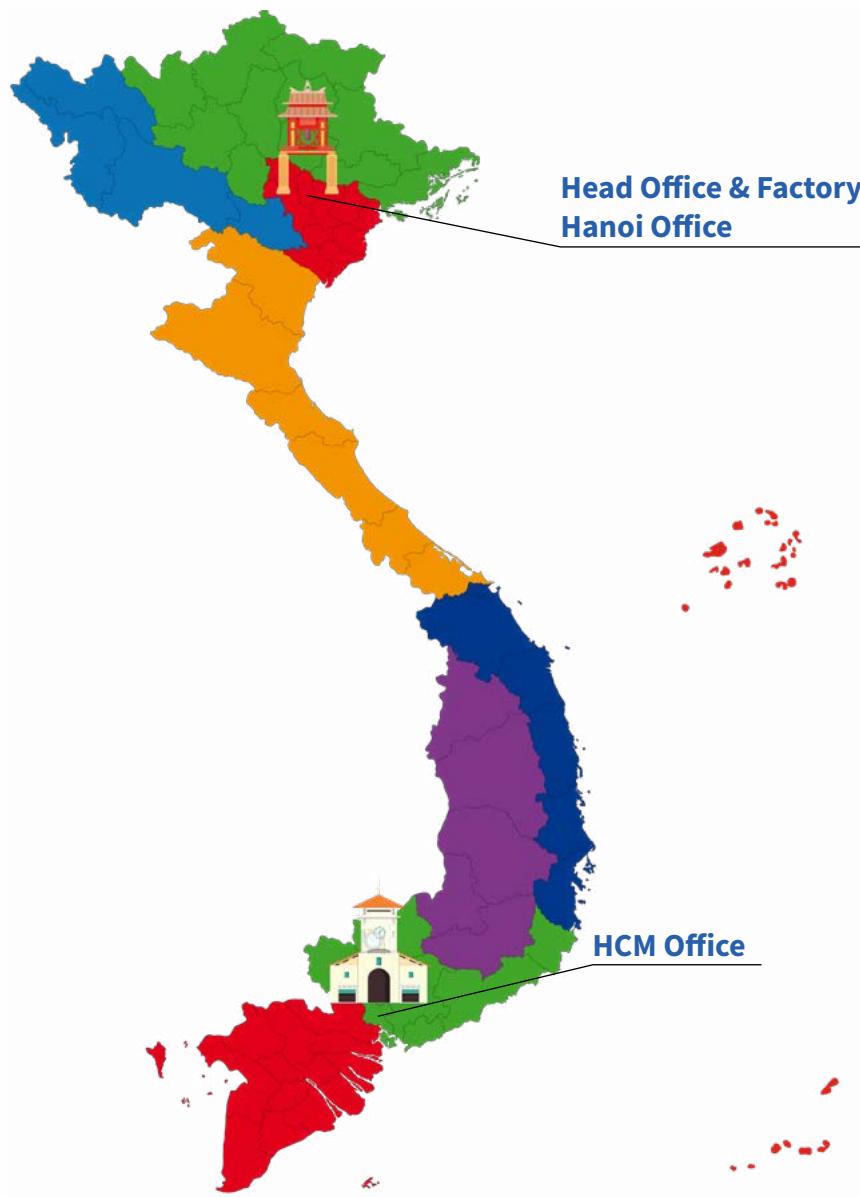


ISO 14001:2015



ISO 45001:2018

TOSHIBA



TOSHIBA TRANSMISSION & DISTRIBUTION SYSTEMS (VIETNAM) LTD. - TTDV

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Support

