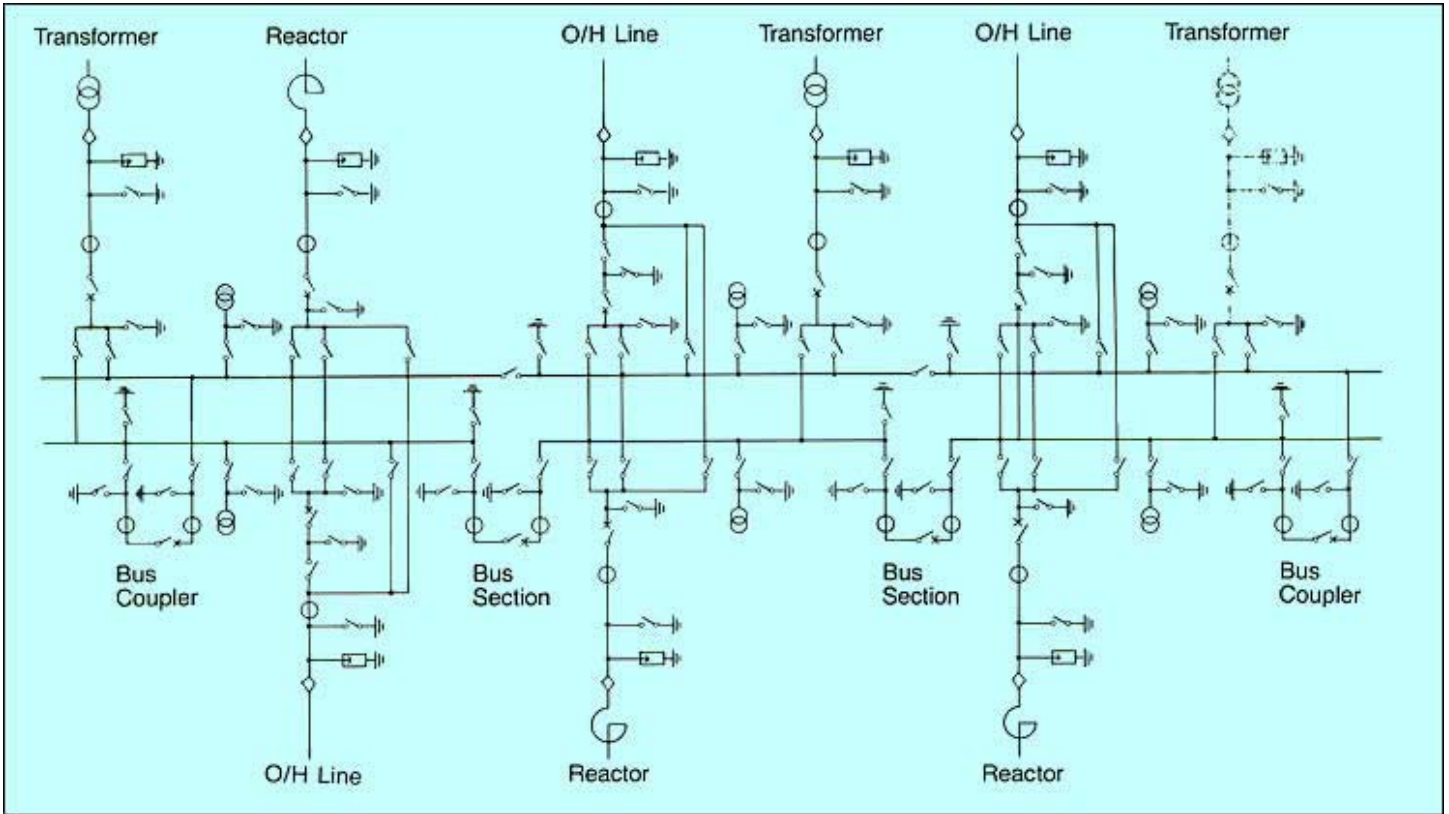


TOSHIBA

800kV GAS INSULATED SWITCHGEAR



800kV Substation Single-line Diagram



Ratings

Rated Voltage:	800kV
Rated Normal Current:	5,000A
Rated Breaking Current:	50kA
Rated Insulation Level	
Lightning Impulse:	2,100kV
Switching Impulse:	1,425kV
Power Frequency:	960kV
Line CB, Bus Coupler CB:	With Closing Resistor
Bus Disconnector:	With Loop Current Breaking Capability
Line Earthing Switch:	With Capacitive Charging Current Breaking Capability
Surge Arrester Maximum Residual Voltage:	1,440kV (at 20kA)
Voltage Transformer:	Inductive Type with Ferro-resonance Preventive Capability

800kV GIS



R&D



Full-voltage Breaking Test of GCB

The dielectric performance to the ground during an interruption was verified.

Proto-type GCB interrupted 50kA current successfully with 100% transient recovery voltage between live parts and an enclosure.

Long-term Reliability Test of Insulator

All types of insulators were subjected to a long-term reliability test.

1.3 times the rated voltage was applied continuously for six months with 5,000A flowing in the main circuit in the daytime.

No partial discharge and no defect were observed throughout the test.



R&D



Charging Current Breaking Test of Disconnecter

Disconnecter was verified to withstand restriking surges generated during a capacitive charging current interruption. A direct switching test and synthetic tests were carried out satisfactorily.

Loop Current Interruption Test of Disconnecter

A direct test of 500 times interruption with 5,000A closed-loop current was carried out, and the sufficient dielectric withstandability between live parts and an enclosure during an interruption was verified.



On Site Test



Power-frequency Voltage Test

The test was carried out satisfactorily using a series resonant testing transformer.



Oscillating Switching Impulse Voltage Test

The test was carried out satisfactorily using an oscillating switching impulse generator.



Partial Discharge Test

A corona meter connected to an electrode embedded in a spacer was used to measure partial discharge. No partial discharge was observed.



Ultrasonic Measurement for Particle Detection

The test was carried out using an ultrasonic microphone and no harmful metal particle was detected.

Integrated Control System

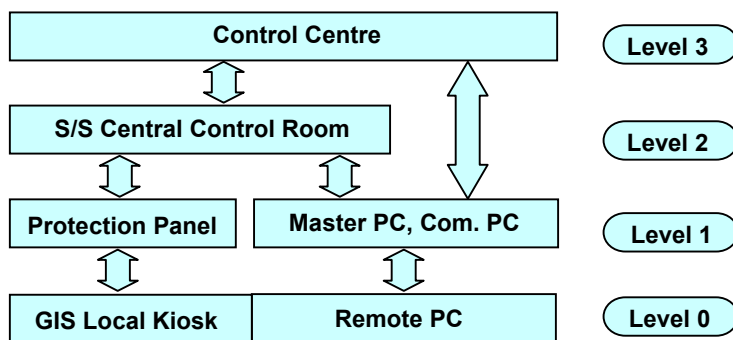
Integrated Control System (ICS) applying a computer and Programmable Controllers (PC) is introduced to control and supervisory of GIS. As the advantage of a computer based system, GIS self-diagnosis function and operating guidance function are realized by the application of Artificial Intelligence.



Control Desk



Master PC



Function	Level 3	Level 2	Level 1	Level 0
Measurement	●	●	●	—
GCB, DS Control	●	●	●	—
Synchronous Check	—	—	●	—
TR Tap Control	●	●	●	—
Alarm Indication	●	●	●	—
Alarm Recording	●	●	●	—
Status Indication	●	●	●	●
Interlocking	—	—	●	●
P.Q. Parity Check	—	●	—	—
GIS Self-diagnosis	—	●	—	●
Operation Guidance	—	●	—	—

Hierarchy and Function



Remote PC

TOSHIBA

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO, 105, JAPAN
TELEX: J22587 TOSHIBA CABLE: TOSHIBATOKYO PHONE: 457-4900

Overseas Office:

Mexico City, Caracas,
Rio de Janeiro, Buenos Aires,
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