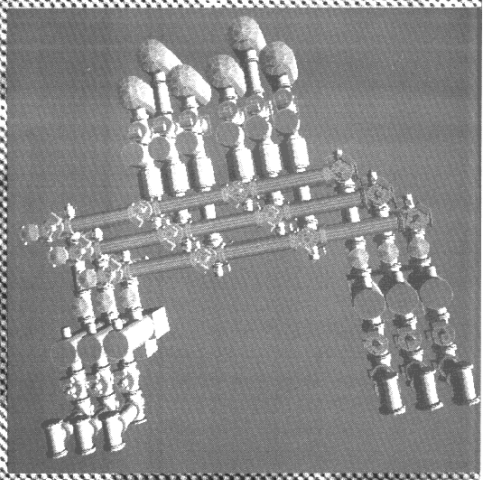
high voltage transmission

SF6 gas-insulated switchgear 72.5 to 550 kv

Hexabloc range

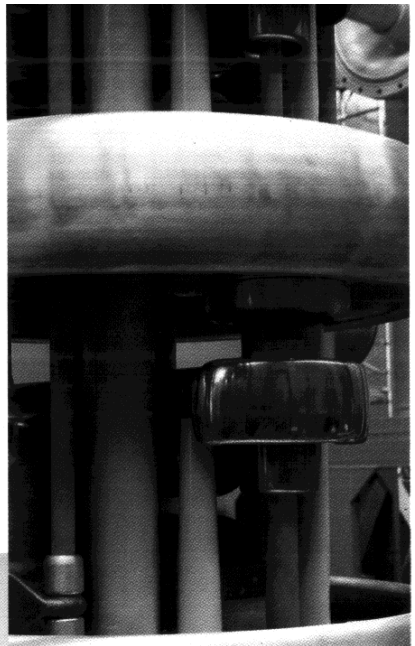


MERLIN GERIN

mastering electrical power

GROUPE SCHNEIDER

Hexabloc GIS
safety, reliability and operational ease



when performance becomes a necessity

The demand by electrical utilities for reliable compact substations offering maximum operating availability has resulted in the increasing use of gas insulated switchgear (GIS) on HV networks worldwide.

modern HV substations

Designed for public and private high voltage transmission networks **up to 550 kV**, the **Hexabloc GIS** range is especially suited to applications with severe design and operating constraints related to :

- site compatibility,
- difficult environments,
- limited space,
- strict zoning laws,
- severe safety regulations,
- etc.

Hexabloc GIS technology offers the user :

- **small overall dimensions**,
- **flexibility**, allowing a wide range of switching configurations,
- high **reliability**,
- continuously improved **safety**.

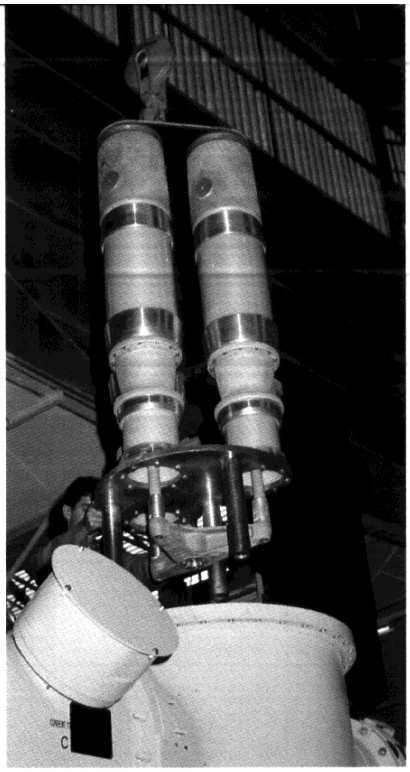
The result is a system that fulfills the two main priorities of users :

- **maximum operational availability**,
- **maximum personnel safety**.

advanced technology from a major manufacturer

A pioneer in SF6 technology, the Merlin Gerin Group has designed unparalleled features into Hexabloc GIS :

- **modular structure**, using factory assembled and tested transport units;
- **easily removable sections** at selected points for reduced down-time in the unlikely event of replacement work;
- **flexibility**, allowing a wide range of substation configurations :
  - **three-phase encapsulation** for voltages from 72.5 to 170 kV, with suitable dimensions for shipment of fully-assembled switchbays,
  - **single-phase encapsulation** for larger units, the most economical for voltages from 245 to 550 kV;
- **enclosures made of aluminum alloy**, offering a number of advantages :
  - **lightweight** for easy handling and reduced foundation costs;
  - **excellent gas tightness** across seal surfaces;
  - **negligible resistive and eddy current losses**;
  - **high corrosion resistance**;
- **insulators** made of cast epoxy with alumina filler, insensitive to ageing;
- **highly active adsorption filters**, provided in each compartment to remove any residual moisture in the SF6 gas;
- carefully **selected and tested components**, subject to strict procurement specifications.



main characteristics (IEC)

Hexabloc			TH7				H9S		SBE		H10
rated voltage (kV)			**72.5**	**123**	**145**	**170**	**245**	**300**	**362**	**420**	**525**
rated insulation level											
kV rms 50/60 Hz - 1min			140	230	275	325	460	460	460	520	620
kV 1.2/50 us impulse			325	550	650	750	1050	1050	1175	1425	1550
rated frequency (Hz)			50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60
rated current (A)	busbars	2500	■	■	■	■	■	■	■	■	■
		3000	■	■	■	■	■	■	■	■	■
		3150	■	■	■	■	■	■	■	■	■
		4000					■	■	■	■	■
		6300									■
	feeders	2500	■	■	■	■	■	■	■	■	■
		3000	■	■	■	■	■	■	■	■	■
		3150	■	■	■	■	■	■	■	■	■
		4000									■
max. short time withstand current (kA rms-1s)			40	40	40	40	50	50	50	50	63

the flexibility of a ready-to-install solution

Extensive preassembly and testing of large transport units in the factory makes for fast and easy on-site installation.

compatible with any environment

Hexabloc GIS offers all the increasingly important environmental compatibility characteristics :

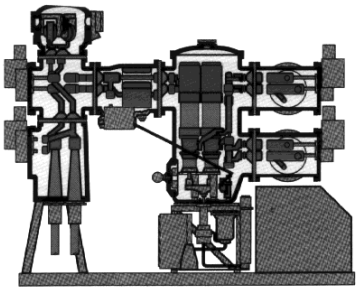
■ **small overall size**, meaning reduced cost in zones where space is at a premium :
□ urban zones (possibility of installation in basements, even in residential buildings);
□ hydropower plants and pumping stations;
□ mountainous areas where level space is limited;

■ **small ground area**, resulting in major savings on :
□ site preparation;
□ foundations;
□ slabs, trenches, conduits, etc.;

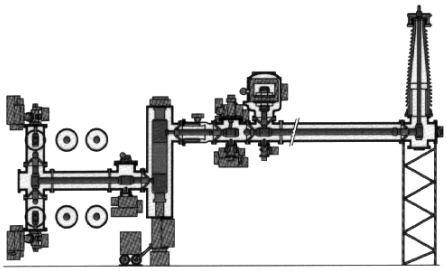
■ **«low profile» design**, for installation inside small buildings, offering further advantages :
□ installation, operation and maintenance regardless of weather conditions;
□ out of sight;
□ protection against intrusion and intentional damage;
□ sheltered from corrosive atmospheres;

■ **disturbance-free**: no corona effect, radio-frequency interference, noise, etc.

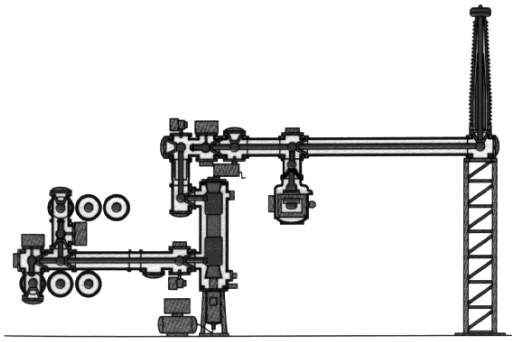
TH7 switchbay



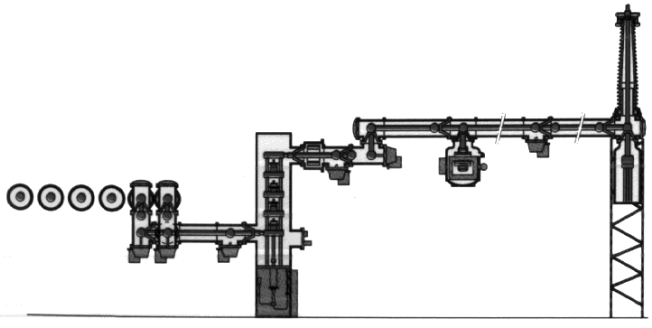
H9S switchbay



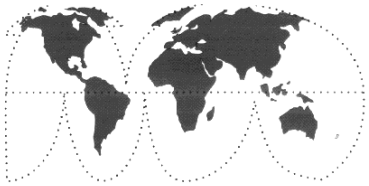
SBE switchbay



H10 switchbay



some references



Hexabloc GIS:

72.5 kV substations

Egypt
Egyptian Electricity Authority
Talkha
France
Electricité de France
Saint Egrève
Brazil
Companhia Petroquimica do Nordeste S.A.

121/123 kV substations

Colombia
Electribol Cartagena
Zaragocilla
Mexico
Comision Federal de Electricidad
Condesa
Venezuela
Pequiven
El Tablazo

145 kV substations

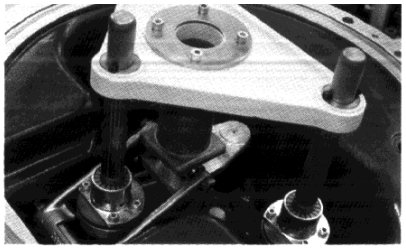
Malaysia
Lembaga Letrik Negara
Kuala Lumpur (East)
Saudi Arabia
Saudi Consolidated Electric Company
Central Region : twenty-two s/ss

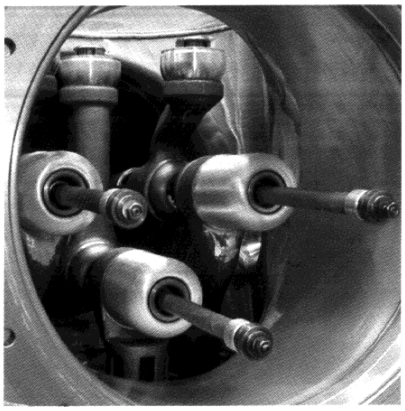
242/245/300 kV substations

Canada
Edmonton Power
Bellamy 242 kV s/s
USA
Arizona Public Service
Meadow Brook 242 kV s/s
Colombia
Empresas Publicas de Medellin
Occidente and Tasajera 245 kV s/ss
Egypt
Egyptian Electricity Authority
Talkha 245 kV s/s
France
Electricité de France
Belle de Mai 245 kV s/s
New Zealand
New Zealand Electricity Department
Rangipo 245 kV s/s
Spain
Union Fenosa
Prosperidad 245 kV s/s
Thailand
Electricity Generating Authority of Thailand
On Nuch 245 kV s/s
Republic of South Africa
Electricity Supply Commission
Invubu 300 kV s/s

420/525/550 kV substations

France
Electricité de France
Coulange 420 kV s/s
Italy
Ente Nazionale per l'Energia Elettrica
Sulcis and Mercallo 420 kV s/ss
Australia
State Electricity Commission of Victoria
Sydenham 525 kV s/s
People's Republic of China
Huaneng International Power Company
Shindongkou 550 kV s/s





Hexabloc quality through rigor

Hexabloc gas insulated switchgear complies with **IEC** international recommendations as well as with most **national standards**.

At every step in the manufacturing process, each component is subjected to **inspection** and **rigorous testing** including :

- X-ray analysis of each insulator;
- partial discharge measurements;
- routine tests required by standards and regulations;
- etc.

Moreover, design and production of the Hexabloc GIS range comply with the requirements of the **ISO 9000** standards.

This rigor ensures the **high level of operational availability** indispensable for HV GIS.

high safety level

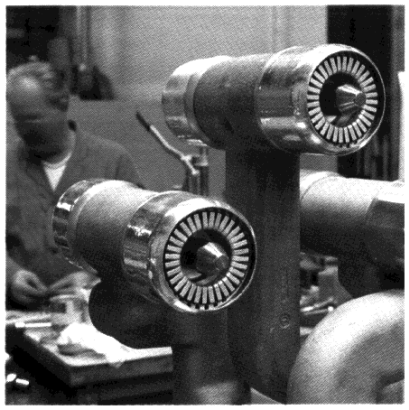
Operating personnel benefit from exception safety conditions preventing :

- direct contact with live parts;
- uncontrolled arcing;
- insulation problems caused by environmental conditions;
- etc.

This high level of safety is made possible by :

- earthing of the metal enclosure;
- reinforcement of the enclosures in the vicinity of the flanges;
- interlocking systems designed to prevent switching errors;
- indicators directly linked to the positions of the moving contacts and clearly visible from the ground.

Furthermore, the enclosures are designed and tested to comply with pressure vessel specifications.



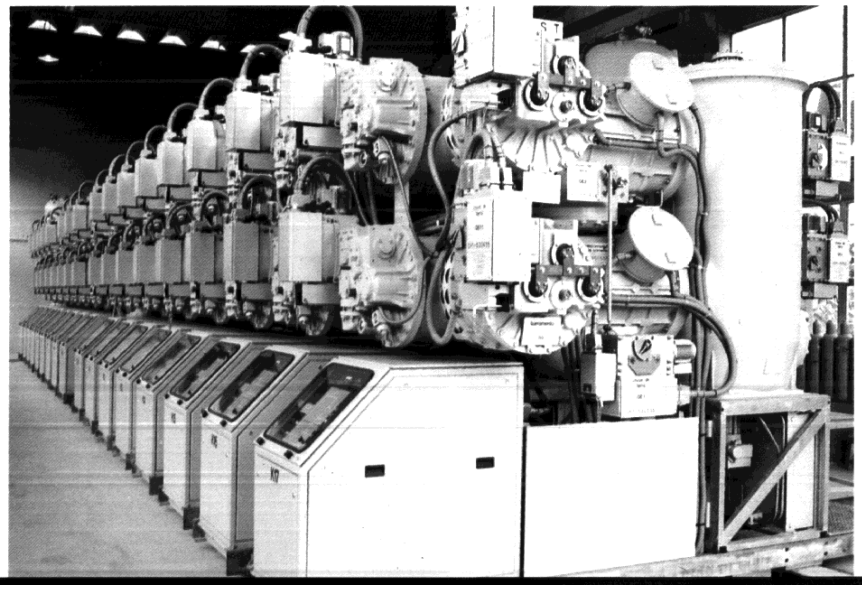
Hexabloc GIS reducing your workload

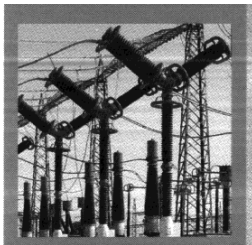
The high degree of **reliability** offered by Hexabloc technology has made it possible to considerably **reduce** the frequency and duration of **maintenance operations** :

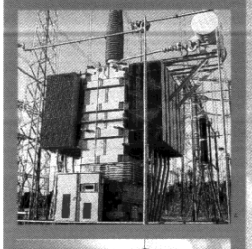
- initial maintenance is required only after six years of operation;
- maintenance can be carried out at ground level and concerns only the circuit breakers (no compartments need be opened);
- the time required is reduced by easy access to all parts for servicing.

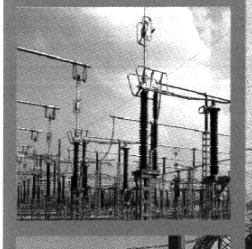
The **low cost** of maintenance represents major **operating savings**.

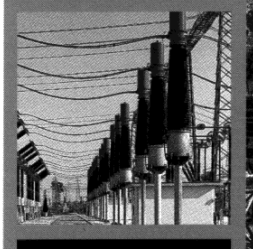
Since 1967, over 1300 Hexabloc switchbays with ratings from 72.5 to 550 kV have been installed and commissioned by Merlin Gerin in over 200 substations around the world.
Today, they continue to fulfill the requirements of electrical utilities under widely varying climatic conditions.

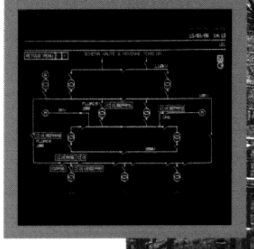












Merlin Gerin's high voltage offer includes...

equipment for conventional substations, such as :

- disconnectors;
- instrument transformers;
- circuit breakers;
- surge arresters;
- power transformers;
- shunt coils;
- control, monitoring and protection systems.

... and services

- turnkey HV substations;
- commissioning;
- maintenance;
- training.

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