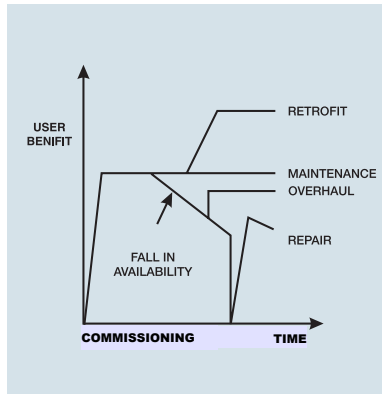


# Medium voltage retrofit solutions

Optimizing investment and performance



# ABB – a global technology leader

ABB is a global leader in Power and Automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group operates in around 100 countries and employs over 1,08,000 people.

In India, ABB serves customers with a complete range of power and automation technologies. The company has a vast installed base, extensive manufacturing facilities and a countrywide marketing and service presence.

As a part of its Power Technologies offering, ABB serves electric, gas and water utilities as well as industrial and commercial customers with a wide range of products, systems and services for power generation, transmission and distribution. ABB's system solutions include Electrical Balance of Plant (EBOP) automation, controls and instrumentation, for power plants, bulk power transmission systems, turnkey substations, automation controls and instrumentation, utility automation and power distribution.

The product offering includes a wide spectrum of technologies across the entire voltage range including indoor and outdoor circuit breakers, air and gas insulated switchgear, disconnectors, capacitor banks, reactive power compensators, power transformers, distribution transformers, instrument transformers, Compact Secondary substations (CSS) and Ring Main Units (RMU).

## Advantage ABB

- ✓ 120 years of technology and innovation
- ✓ Unparalleled domain competence
- ✓ Global experience
- ✓ Complete solution capabilities
- ✓ Large installed base
- ✓ Environment-friendly technologies



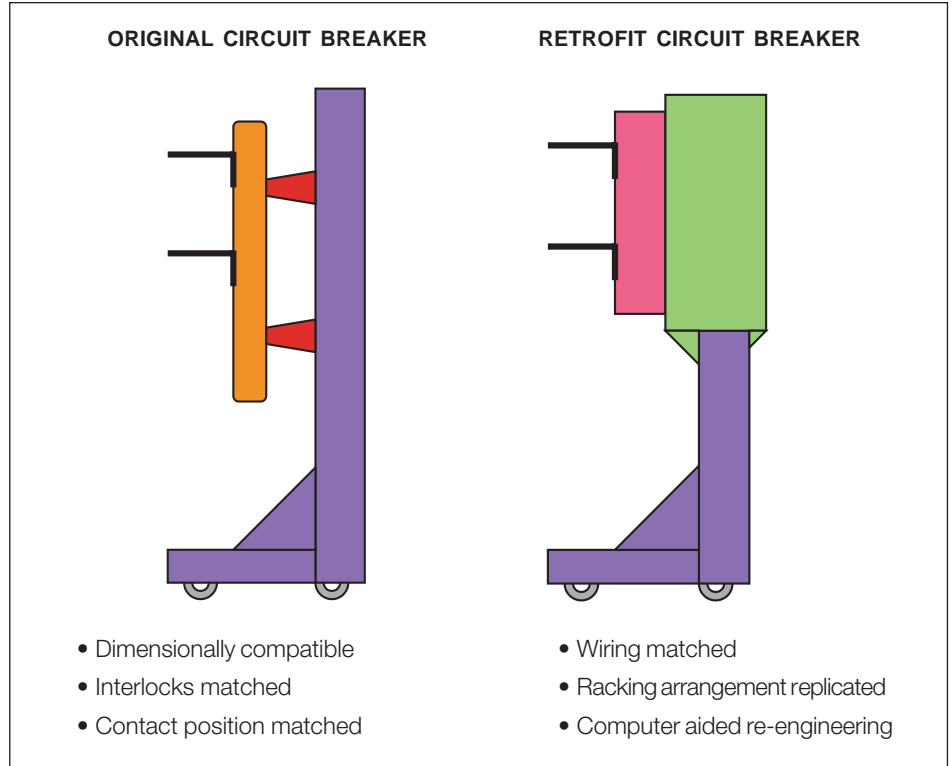
Retrofit of Reyrolle air blast circuit breakers with ABB SF6 circuit breakers



# One-to-one retrofit solutions

In a one-to-one retrofit solution the new circuit breaker is re-engineered:

- The static portions of switchgear panel, busbars, CT/cable compartment and relay/metering compartment are not changed
- The horizontal/vertical travel distance of the breaker truck is matched with that of the old breaker
- The isolating power, main contacts and auxiliary contacts of the circuit breaker is matched with those of the old breaker
- Interchangeability of the breaker is maintained
- Retrofit can be taken up at convenient, short, pre-planned shutdowns



ASEA make MOCB retrofitted with ABB vacuum circuit breaker



- Voltage class: 12kV
- Rated current: up to 3000A
- Breaking current: up to 40kA

BBC MOCB retrofitted with ABB SF6 circuit breaker



- Voltage class: 12kV
- Rated current: up to 2000A
- Breaking current: up to 40kA

Voltas SF6 circuit breaker retrofitted with ABB SF6 circuit breaker



- Voltage class: 12kV
- Rated current: up to 3000A
- Breaking current: up to 40kA

Russian MOCB retrofitted with ABB SF6 circuit breaker



- Voltage class: 12kV
- Rated current: up to 2500A
- Breaking current: up to 40kA

NGEF MOCB retrofitted with ABB vacuum circuit breaker



- Voltage class: 12kV
- Rated current: up to 3000A
- Breaking current: up to 40kA

Westinghouse BOCB retrofitted with ABB vacuum circuit breaker



- Voltage class: 12kV
- Rated current: up to 1250A
- Breaking current: up to 25kA

Fuji make MOCB retrofitted with ABB vacuum circuit breaker



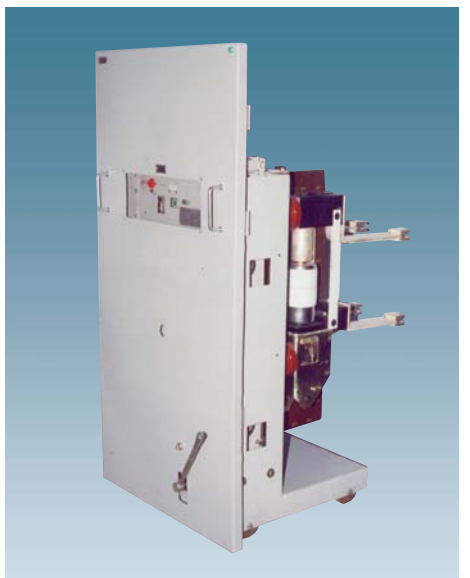
- Voltage class: 12kV
- Rated current: up to 3000A
- Breaking current: up to 40kA

Reyrolle BOCB retrofitted with ABB vacuum circuit breaker



- Voltage class: 12kV
- Rated current: up to 1600A
- Breaking current: up to 25kA

Siemens make MOCB retrofitted with ABB vacuum circuit breaker

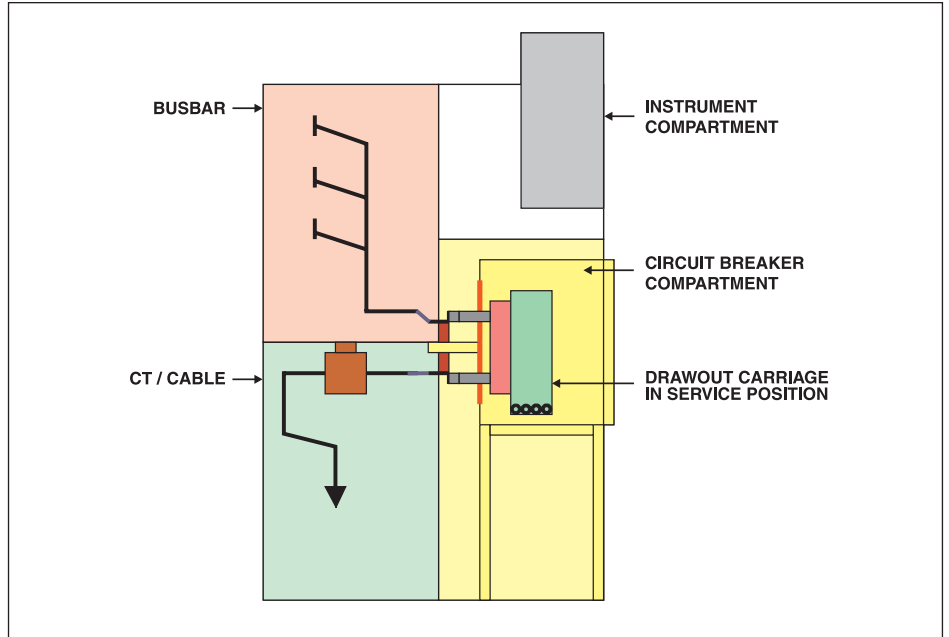


- Voltage class: 12kV
- Rated current: up to 2000A
- Breaking current: up to 40kA

# Module retrofit solutions

In a module retrofit solution, the circuit breaker compartment is re-engineered :

- The old circuit breaker along with the breaker compartment is replaced with the new circuit breaker and breaker housing designed and tested for the existing switchgear
- Existing partitions, shutters, power contacts, racking mechanism and control circuit plugs and sockets are replaced with new ones as required
- The jumper links in the busbar compartment are modified to match the contacts of the retrofitted module
- Precise alignment of breaker and panel contacts is ensured during product design and assembly



UNISAFE MODULE with ABB Vacuum circuit breaker / vacuum contactor



- Voltage class: 12kV
- Rated current: up to 1250A
- Breaking current: up to 25kA

VHA12 MODULE with ABB SF6 / Vacuum circuit breaker/vacuum contactor



- Voltage class: 12kV
- Rated current: up to 3000A
- Breaking current: up to 40kA

VHA33 MODULE with ABB SF6 circuit breaker



- Voltage class: 33kV
- Rated current: up to 2500A
- Breaking current: up to 25kA

### Make of MV Circuit Breakers retrofitted by ABB

Sr. no.	Existing CB Make	Existing CB Type	Retrofitted CB Type
1	ABB / ASEA/BBC	ABCB / MOCB	SF6 / VCB /V-Contact
2	VOLTAS	SF6	SF6 /VCB / V-Contact
3	RUSSIAN	ABCB / MOCB	SF6
4	NGEF	MOCB / SF6	SF6/ VCB / V-Contact
5	WESTINGHOUSE	BOCB	VCB
6	FUJI	MOCB	VCB
7	REYROLLE	BOCB, ABCB	SF6 / VCB
8	SIEMENS	MOCB	SF6 / VCB

### Some significant retrofit solutions executed by ABB

Customer	Rating
NTPC	12 / 6.6 kV
Tata Power Company Ltd	11 / 24 / 36 kV
MPPGCL	6.6 kV
UPVUNL	12 / 6.6 / 3.3 kV
APPGCL	12 kV
MARUTI / HYUNDAI	12 / 6.6 kV
MRF/CEAT/GOODYEAR	12 / 6.6 kV
ONGC	22 / 12 / 6.6 kV
AIR	12 / 6.6 kV
GRASIM - Cement Plants	12 / 6.6 kV
SAIL	12 / 6.6 kV
NALCO/BALCO	12 / 6.6 KV
Hindustan New Print Ltd	12 kV

### ABB medium voltage retrofit solutions - Installed base (up to March 2007)

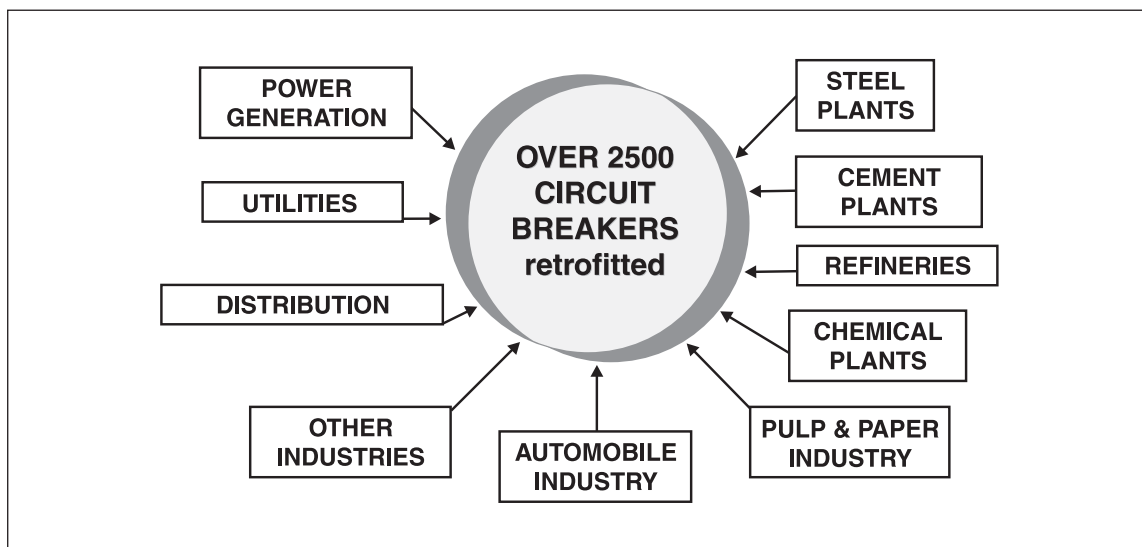




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