Powerful-CB:

Fault Limiting Circuit Breakers

THE SUNDAY TIMES 30 BEST BIG COMPANIES TO WORK FOR 2017

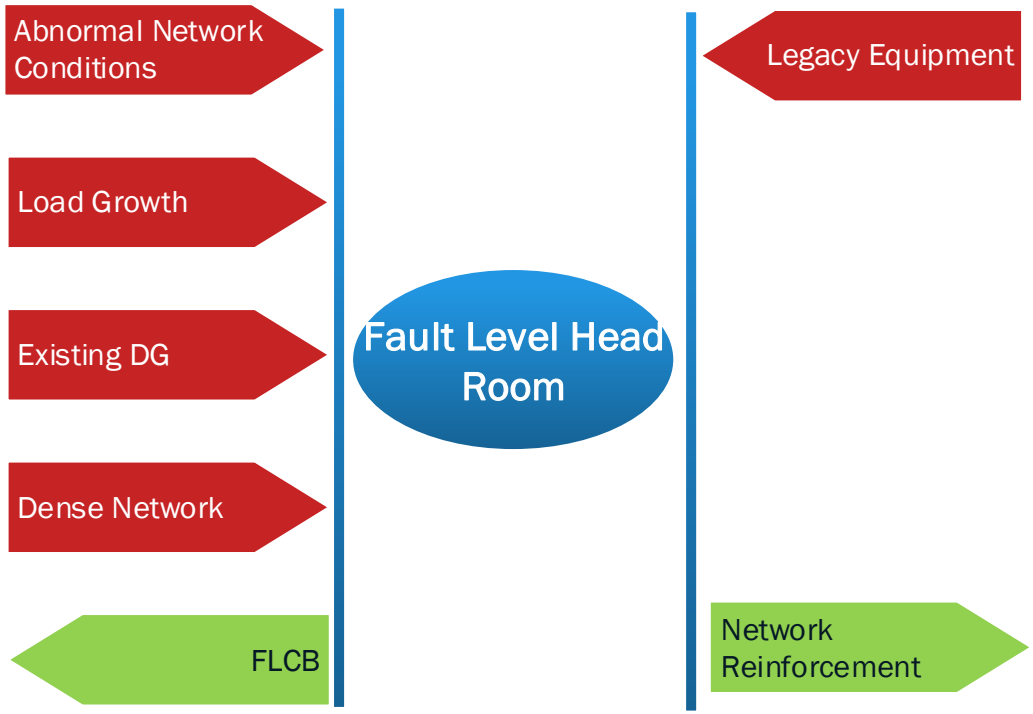
Utility Week Awards 2016 WINNER Utility of the Year

INVESTORS IN PEOPLE | Gold

UK Power Networks
Delivering your electricity

Why It Is Needed / Industrial Need / Project Relevance

- **DG Installations –** Increasing rapidly
- **Urban fault level constraints:**
  - Cable size
  - Direct transformation from 132kV to 11kV
  - High degree of interconnections
  - DG connections
- **New DG** - 62% will need network reinforcement or intertrip scheme.
- **Present solutions** - bulky, expensive.



FLCB – Purpose & Basic Operation

- **Solid-state CB** – no fault current contribution.
- **Normal network operation** - no effect.
- **Post abnormal condition** – automatic reclose.
- **Speed of operation** - 20x faster than VCB.
- **Two bespoke solutions:**
  - **Installed in substation** – Method 1 (ABB)

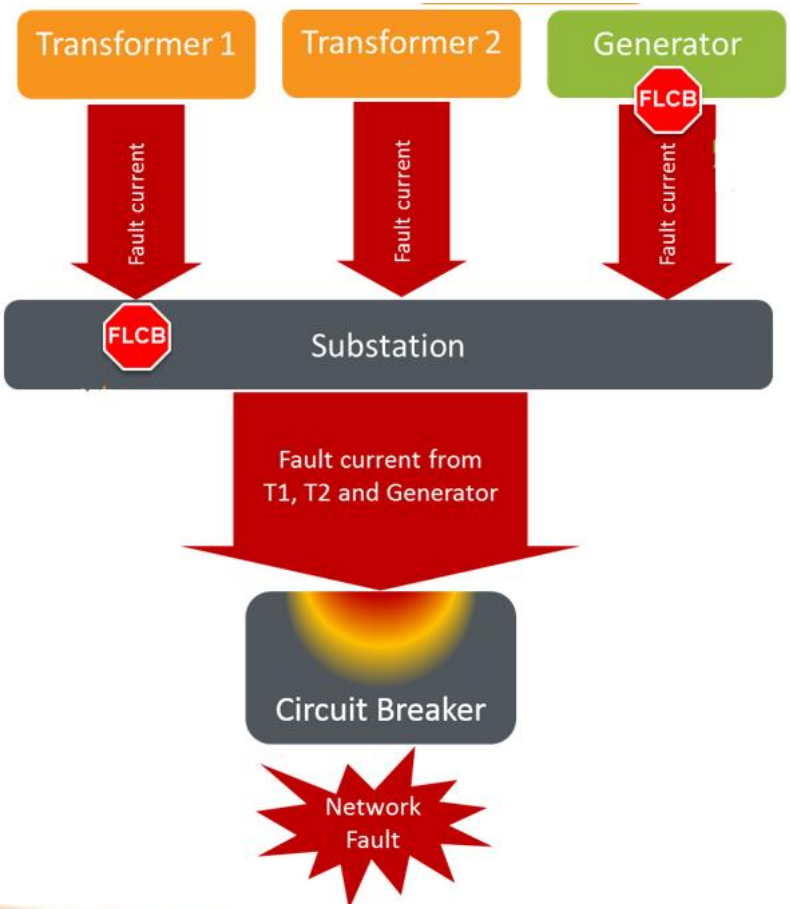
World's first
CB with fast commutation switch

50% lower fault level
On substation with two transformers

  - **Installed in customer`s site** – Method 2 (AMAT)

First in GB
Fault limiting device on customer`s premises

No increase in fault level
From customer`s generator



Benefits

General Benefits

- **Low carbon policy objectives –** Enable achievement.
- **Savings** - £400m in reinforcement costs by 2050.
- **Additional DG installations** - 460MW.
- **Reduction in CO2 emissions -** up to 3 800kT (800 000 cars) by 2050.
- **Network planning** – improve strategy.
- **Findings impact** - Share outcomes.

Customer Specific Benefits

- **Cheaper** cost of connections.
  - 80% cheaper than switchgear upgrades
  - 50% cheaper than a fault limiting device
- **Smaller** than other fault limiting systems.
- **Faster** connection of new DG.