

KAHRAMAA (QATAR) – 400KV CURRENT LIMITING REACTORS AT ABU NAKHLAH SUBSTATION – BALADIYAT AD DAWHAH PROJECT

CHALLENGES

The objective of this project is to assist the customer, Kahramaa (Qatar), in mitigating bus fault currents. This involves reducing the bus fault level or current, taking into account the future expansion of new grid substations and power stations that will be connected to the 400 kV high voltage grid.

The customer have selected two major existing substations: Abu Nakhlah super(ANS) Substation and Logistic zone super (LZS) Substation. In ANS Substation, 4 sets of Current Limiting Reactors (CLRs) will be installed, with each reactor connected in parallel with a CLR capacitor. This setup will effectively manage transient or switching voltages during CLR operation. Meanwhile, at LZS Substation, 2 sets of CLR's will be installed along with CLR Capacitors.

Our customer, Larsen & Toubro Ltd., commissioned CONDIS for capacitor development. The challenge was to design 25 nF CLR Capacitors isolated from ground by a support insulator and installed in parallel with the CLR Reactor.

SOLUTIONS & SERVICES



CONDIS invested 2 years in developing the following customised solution to meet the customer challenges and requirements :

- 25 nF CLR HV capacitor assembly
- support insulator
- corona-ring
- NEMA connectors

WHY CONDIS ?

As world leader in high-voltage capacitors, our experts can design and manufacture customised and high-quality capacitors with a higher capacitance value per capacitor than its competition.

Also, capacitors can be purchased directly from us, independently from reactors, enabling a cost-effective approach to extend the lifetime expectancy of your substation equipment.



CURRENT LIMITING REACTORS (CLR) CAPACITORS

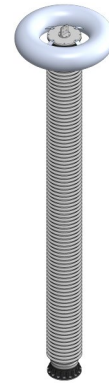
CURRENT LIMITING REACTORS ARE USED WHEN THE SHORT-CIRCUIT CURRENT IN A DISTRIBUTION OR TRANSMISSION ELECTRICAL SYSTEM WILL EXCEED THE INTERRUPTING RATING OF THE SWITCHGEAR.

CLR ARE AN ALTERNATIVE TO THE REPLACEMENT OF A CIRCUIT BREAKER IN THE SWITCHGEAR BY LIMITING SHORT-CIRCUIT CURRENT LEVELS.

IT ALLOWS A LONGER OPERATION OF THE CIRCUIT BREAKER AND AVOIDS ITS PREMATURE WEAR.

CLR are associated with big inductances. This could produce severe transient recovery voltage (TRV) or rise the rate of recovery voltage (RRRV) across the circuit breaker contacts, during an opening in case of short line fault. CLR Capacitors help mitigate this phenomenon.

CLR Capacitors are installed in parallel to the series reactor (CLR) and/or on each of its terminals phase to ground.



KEY ADVANTAGE

Based on a highly flexible technology, our experts design CLR capacitors to meet specific mechanical and electrical requirements.

- ✓ Long maintenance-free lifetime
- ✓ Swiss Made
- ✓ Larger capacitance value than competition in one single capacitor

PRODUCT FEATURES

These are sample values. Values out of these ranges are available upon request.

Capacitance	built up to 30nF
Typical cantilever strength value	built up to 25kNm
Nominal voltage Um	built from 63 kV up to 550 kV 50/60Hz
Switching impulse voltage	built up to 1175kV 250/2500µs
Lightning impulse voltage	built up to 1550kV 1.2/50µs
Adapted corona rings can be included if required	