Case studies

Source Ground Return with SACE Emax 2
The Customer
SEI S.r.l. was founded in 2005 and in few years has become a leading company as manufacturer of LV switchgear. It is present worldwide with high-quality products, which can be customized to meet the designing requirements of its customers.

The challenge
The project concerns a plant for crude oil delivery realized on behalf of an oil and gas company.
The challenge was to provide complete and total protection against earth faults in any point of the plant, with the commitment of guaranteeing selectivity between the MV and LV circuit-breakers to isolate only the area affected by the fault.

Complete protection of the plant
100% protection for the electrical plant, using a single protection device

Thanks to the unique features of Emax 2 with the Ekip signalling module, it has been possible to get such a quick trip time that the fault is eliminated before the MV circuit-breaker receives the opening command.
The ABB solution
Using the Ekip Hi-Touch trip unit and with no need of indirect multifunction relays, it has been possible to protect the plant by managing two independent curves for the protection against earth faults (function G).

Thus, the function Source Ground Return is implemented, which guarantees protection against the earth faults, both on the supply (restricted) as well as on the load side (unrestricted) of the circuit-breaker terminals, and protection for the connection cable (from the transformer secondary winding to the circuit-breaker terminals).

The solution with SACE Emax 2 guarantees time selectivity for any earth fault on the load side of the LV circuit-breaker thanks to such a quick trip time that the fault is eliminated before the MV circuit-breaker receives the opening command. In case of a fault between the secondary winding of the transformer and the input terminals of the LV circuit-breaker, Ekip Hi-Touch, through the Ekip Signalling module, will command the opening of the MV circuit-breaker.

This solution requires the following accessories:

- Ekip 2K Signalling modules supply two input and two output contacts for remote control and signalling of alarms and circuit-breaker trips. These contacts can be programmed from the display of the trip unit. Furthermore, by means of the Ekip Connect software, combinations of events can be freely configured.

- Ekip Signalling 2k

- Homopolar toroid for the earthing conductor of main power supply

The Ekip Hi-Touch trip unit can be used with an external toroid positioned on the conductor that connects the star centre of the MV/LV transformer to earth. In this case, the earth protection is called Source Ground Return. The toroid is available in four sizes: 100A, 250A, 400A, 800A.

- Medium Voltage Breaker

- Ekip Hi-Touch

- Unrestricted Earth Fault

- Restricted Earth Fault

- Source ground return

- Homopolar toroid for the earthing conductor of main power supply

- Ekip 2K Signalling modules supply two input and two output contacts for remote control and signalling of alarms and circuit-breaker trips. These contacts can be programmed from the display of the trip unit. Furthermore, by means of the Ekip Connect software, combinations of events can be freely configured.
Contact us

For more information please contact:

ABB SACE
A division of ABB S.p.A.
L.V. Breakers
Via Pescaria, 5
24123 Bergamo - Italy
Tel.: +39 035 395 111
Fax: +39 035 395306-433
www.abb.com