



Case studies

## Source Ground Return with SACE Emax 2

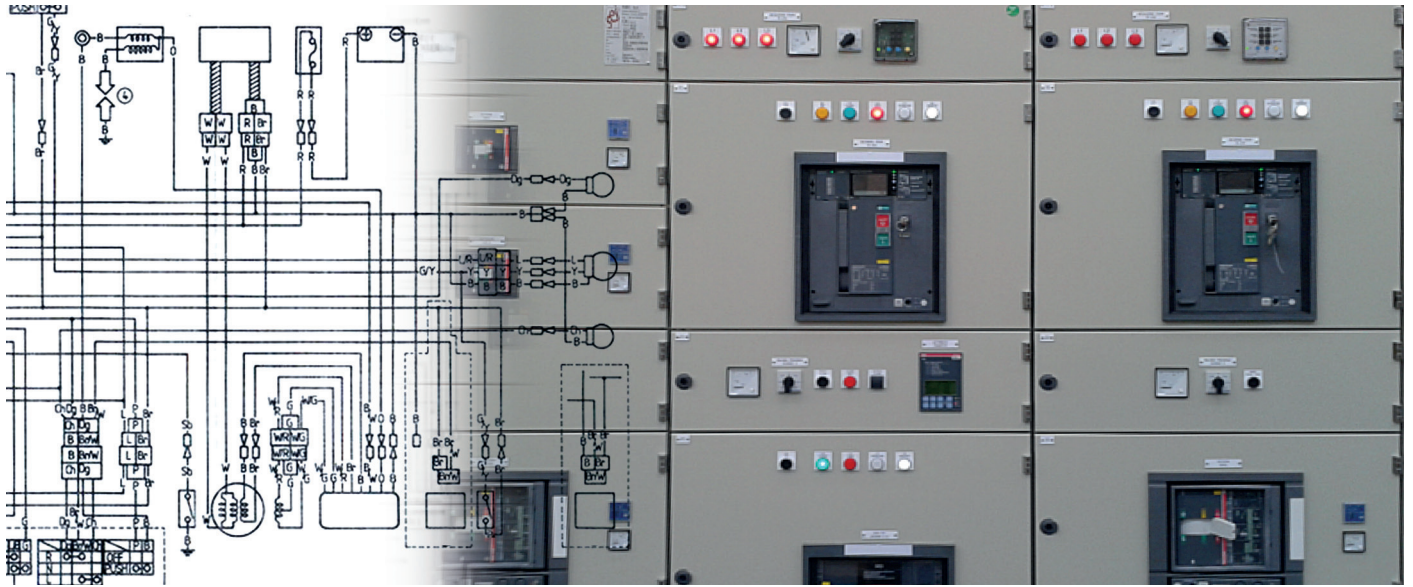
## The Customer

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

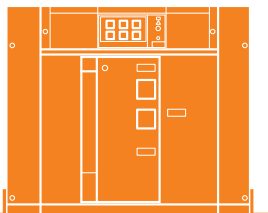
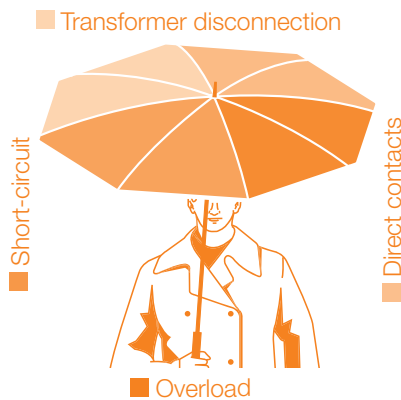
The project concerns a plant for crude oil delivery realized on behalf of an oil and gas company.

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



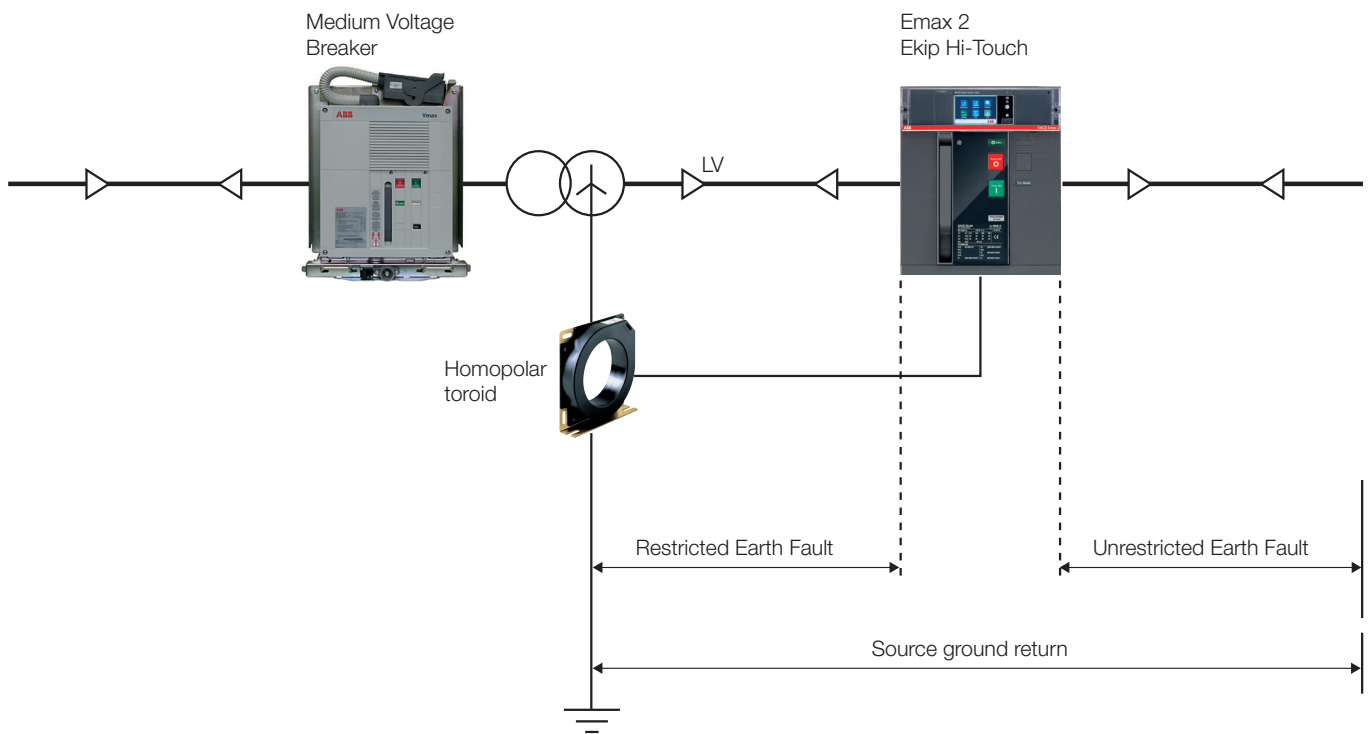
Thanks to the unique features of Emax 2 with the Ekip signalling module, it has been possible to get such a quick trip time that the fault is eliminated before the MV circuit-breaker receives the opening command.

## 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:



### Emax 2 with Ekip Hi-Touch

Ekip Hi-Touch is a high-performance multifunction unit able to protect even the most complex electrical installations. As standard, Ekip Hi-Touch is provided with the measuring and protection module Ekip Measuring Pro and can also be fitted with the additional features provided by the internal modules and by the external accessories.

The front interface of the unit is extremely simple thanks to the touchscreen colour display. It is able to show measurements, bar graphs and sine curves of the different electrical values.



### 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.



### Ekip Signalling 2k

The 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

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