819 – Shunt reactor compensation for subsea cables in industrial plants

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Abstract: In Oil & Gas plants, there is sometimes the need to provide a transmission link at Extra-High voltage levels, typically from 132 kV to 245 kV, between an on-shore central process facility and other units installed on remote islands. In this scenario, the only way to provide the link is to use submarine cables.

The charging current of cables, especially for significantly long routes, raises however serious constraints about the maximum cable charging capacitive current which can be safely handled by Extra-High voltage circuit breakers under no-load switching conditions. In order to overcome this issue, shunt reactors are installed without circuit breaker feeders rigidly at one cable end or alternatively at both cable ends.

Electromagnetic switching studies are performed in order to determine the least amount and the lowest number of points of connection for the shunt reactor power compensation, and to avoid the use of special circuit breakers like those having non-simultaneous pole operation intended for controlled switching.