



Healthy pole control strategy

Converter stations coordination principles

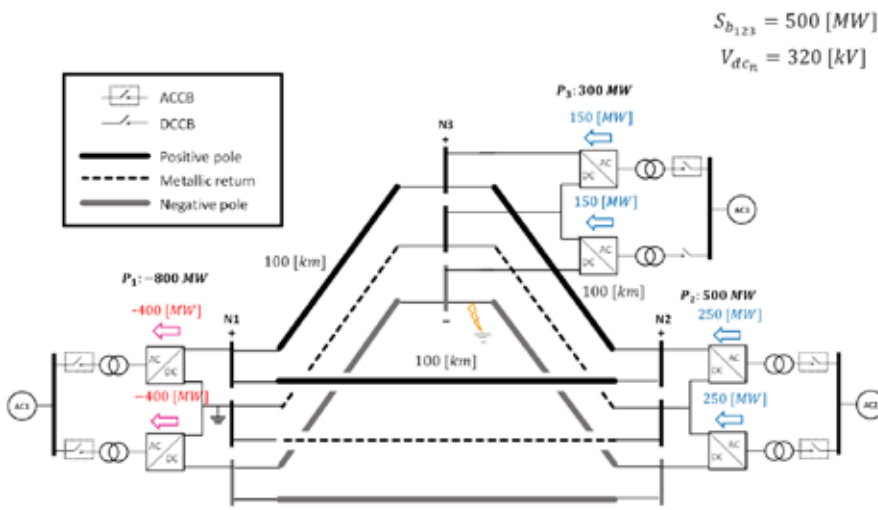
CONTEXT

Grid protection is a capital part of power systems design. For HVDC systems, the protection strategy has to clear the DC fault and restore the power in the grid as soon as possible so that the connected AC grid is not negatively impacted. In this context, the advantage of non-selective protection strategies is that no ultra-fast circuit breakers or ultra-fast identification algorithms are needed for the fault current suppression. However, the main drawback is that the power is not transferred through the HVDC system for a certain lapse of time. In case of bipolar HVDC grid system (or double monopolar system), it is reasonable to consider that a DC fault in one pole may not lead to significant disturbance of the other pole (the Healthy pole). Therefore, during faulty pole protection and restoration process, the healthy pole may be controlled in such a way that it compensates the loss of power transfer caused by the faulty pole.

TECHNOLOGY DESCRIPTION

Healthy pole control strategy objective is to achieve a fast power ramp-up, followed by a fast power ramp-down, while respecting following constraints:

- physical limits of converters
- power balancing in healthy pole (condition for DC voltage stability)



APPLICATION DOMAIN

Multi-terminal DC grid in bipolar (or double monopole) configuration. Especially relevant in case of non-selective protection strategies, or protection strategies that lead to power transfer temporary interruption.

ADVANTAGES

To take benefit of having a bipolar scheme (or double monopole), and use healthy pole to enhance AC system stability during faulty pole transient.

TRL SCALE



EMT simulation work.

DELIVERABLES

Patent appl. FR1756538 / PCT

