EUR24_14 - Circuit breaker performances selection for near-to-generator fault current interruption

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Abstract:

Several installations (not limited to Oil & Gas segment) include synchronous generators and in some cases synchronous motors. Under short-circuit conditions, the fault currents generated from the synchronous machine are characterized by a high level of asymmetry that requires adequate circuit breaker performances to ensure safe fault current interruption.
Calculation of such interrupting performances essential for an effective circuit breaker selection validation (IEC Standard considered in this paper), needs to be properly addressed considering: short-circuit current calculation Standards that differ depending on installation type (onshore and offshore), network topology and on IEC circuit breaker Standards.
A methodical step is discussed by presenting a real case study to consider the symmetrical and asymmetrical components of the fault current and delayed zero crossing phenomena. Additionally, a sets of sensitivity analysis is proposed to provide at the reader an overall feeling about potential critical condition.