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**Additional functions of the upgraded TCSR with split windings.**

The design of 500 kV thyristor controlled shunt reactor (TCSR) with split windings developed in Russia is considered. The article discovers some novel investigation results of TCSR operation in 500 kV grids conducted by R&D center of the Federal Grid Company of Unified Energy System. It is shown that the discussed type of TCSR is effective for extinguishing the secondary arc current caused by the phase line to ground fault. It is shown that the discussed type of TCSR can speed up line auto reclosing. HV transmission line equipped with TCSR is considered during single-phase auto reclosing and it is shown that the rate of controlled shunt reactor allows to avoid resonant overvoltage during single-phase auto reclosing of transmission line. Causes of SF6 circuit breaker failure on fully compensated overhead lines are investigated. It is shown that application of thyristor controlled shunt reactor (TCSR) eliminates the causes of this problem without using any other specific means. Causes of circuit breaker minimum current rating are figured out. It is shown that TCSR idle current switch-off operation is not able to cause overvoltages dangerous enough for the circuit breaker. Ferroresonance phenomenon caused by TCSR inrush currents is examined. It is shown that automatic switch-on of TCSR during transmission line energization prevents ferroresonance excitation.

*Keywords: TCSR, split valve winding, HVAC transmission line SPAR, secondary arc current, SPAR pause, open pole operation of transmission line, resonance overvoltage, compensated overhead lines, SF6 circuit breaker, circuit breaker failure, aperiodic current, TCSR, shunt reactor breaker, current chopping, transient recovery voltage, TCSR idle mode, transient ferroresonance*.

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