

Application of a static synchronous series compensator to increase the transient stability of a powerful HPP.

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A significant influence of a static synchronous series compensator (SSSC) on the transient and small-signal stability is demonstrated using the example of transients in a 500 kV network of a powerful hydroelectric power plant (HPP). Currently, the maximum allowable power output from a HPP is limited on the level of 75 % of the installed capacity by the condition of maintaining transient stability. In order to increase the allowable power output of the plant, the installation of two SSSC on outgoing 500 kV overhead lines is considered. The proposed option of installing the SSSC in a 500 kV network makes it possible to increase the limits of transient stability of the HPP and increase the energy output without additional network reinforcements. The inclusion of stabilizing signals in the SSSC control law improve the quality of transient and small-signal stability.

Keywords: power system, static synchronous series compensator, transient stability, small-signal stability.