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Voltage flicker caused by the electric arc furnace (EAF) and the mitigation using the superconducting synchronous condenser (SuperVAR) by the American Superconductor Corp. are considered in this paper. The modeling of EAF, SuperVAR and the system used are discussed. Fast reactive power support to reduce voltage flicker problem by an EAF is desirable. We use the voltage fluctuation amplitude as an index to evaluate the effectiveness of SuperVAR for two different MVar levels.

It is found that at the PCC (point of common coupling) bus, the application of the SuperVAR can improve the voltage flicker by 6% and 19% by applying DC1A type and AC4A type exciter to the SuperVAR. With an DC1A type exciter, the SuperVAR can output only between +1 and -2 MVAR and with an AC4A type exciter the SuperVAR can provide its full rated power (8MVAR) to the system, therefore the voltage flicker becomes less severe.



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