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Abstract

The load carrying capability of a long AC transmission system can be increased through converting it into simultaneous AC-DC system. Recent analysis presents that the power transmission angle of simultaneous AC-DC system is much higher than that of pure AC system. The power flow in simultaneous AC-DC system with respect to its angle has a peculiar nature. That is, initially power flow increases with the increase of transmission angle and after certain angle the power flow decrease. It is seen that maximum power flow occurs at an angle which is less than 90°. This paper develops a mathematical model for determining the angle of maximum power flow and it can also be used to analyze the impacts of line voltage, line reactance and thermal limits of the conductor on the magnitude of maximum power flow. The model is validated to judge its accuracy and at last the model is applied to some systems to explore its efficacy.