

State-space average modelling of synchronous generator fed 18-pulse diode Rectifier

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Abstract - The paper derives an analytical state-space average-value model of the direct symmetric topology of an 18-pulse AC-DC rectifier. The dynamic characteristics of the rectifier are fully represented while the model is time invariant and computationally efficient. The developed model, validated with comparison of the resultant transient and steady state behaviors with those obtained from detailed simulations of a test system including synchronous generator and DC loads can, therefore, be used for stability assessment of electric power systems with diode rectifiers, multiple power electronic converter-controlled loads and electrical drives.