

5. CONCLUSIONS

The proposed modified SVM allows synchronization of turn-on instants of the switches in the ZVT three-phase VSI / boost rectifier under any operating conditions. In this way the single switch auxiliary circuit can be activated only once per switching cycle to provide ZVS for all main switches and soft turn-off for all diodes. The algorithm also compensates for low frequency distortion that can be caused by the ZVS transitions. The principle of modified SVM can be easily extended to other ZVS converters that require synchronization of the switch turn-on times, as well as to the zero-current switching converters by synchronizing the turn-off times in a similar way.

Advantages of ZVT converter with the proposed modulation algorithm include: very low distortion, true bi-directional operation, low EMI, low voltage and current stresses, high switching frequency, high regulation bandwidth, an low power stage complexity. The modified space vector modulation also allows the converter to provide increased efficiency and to fit in applications which require low EMI and very fast dynamic response with frequent power flow reversals.