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Test results of 3.7 GHz 500kW CW klystron for SST1 LHCD system PROMOD KUMAR SHARMA, KIRAN K. AMBULKAR, SHEFALI DALAKOTI, N. RAJAN BABU, PRAMOD R. PARMAR, CHETAN G. VIRANI, ARVIND L. THAKUR, Institute for Plasma Research — A 3.7 GHz, LHCD system aims to driving non inductive plasma current for SST1 machine. Its capability has been enhanced up to 2 MW by adding two additional klystrons, each rated for 500kW, CW power. The additional klystrons are installed and commissioned at site, for rated power, for more than 1000 seconds, before connecting them to main LHCD system. The auxiliary systems, like supporting power supply system (magnet, filament, ion pump, etc.), active heat management system, slow and fast interlock system, transmission line pressurization system, low power rf drive system, etc. are inter-connected with klystron system through VME based data acquisition and control system for remote CW operation of klystron at rated power. The calorimetric measurements, employing Pt-100 sensors, suggests that the maximum rf power (∼500kW CW) extracted from klystron is dissipated on water cooled dummy loads. The unspent DC power (∼800 kW CW) is dissipated in collector which is heavily cooled with water flowing at ∼1300 litres/min (lpm). The power loss in the klystron body remained within 20 kW. The cavity temperature, measured using J-type thermocouple, remained below 150 °C. The output rf power, sampled through directional couplers and measured by rf detectors shows good agreement with calorimetric measurements. A detailed description of the klystron test set up and the test results obtained during its commissioning is presented in this paper.

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