Contribution ID: **467** Type: **Poster**

3MW Dual Output High Voltage Power Supply Operation: Results for Accuracy, Stability and Protection Test

Wednesday 7 June 2017 13:40 (2 hours)

High temperatures inside tokamak for fusion research is achieved from auxiliary heating systems like neutral beam injectors (NBI), or RF heating devices, viz., ion cyclotron (IC), electron cyclotron and lower hybrid systems where High Voltage Power Supply (HVPS) is an essential requirement. HVPS based on pulse step modulation (PSM) topology has already demonstrated its ability for broadcast transmitters, accelerators using radio frequency (RF) source and neutral beam injectors. For multi MW ICRF source, cascaded chain of amplifier is a practical solution due to limiting level of power with available vacuum tubes. Each chain of amplifier has to provide 1.5MW power in frequency range of 35- 65 MHz for 3600 seconds. The system must be capable to operate both at matched and mismatched load condition (VSWR 2). A novel concept of tapping two outputs from single PSM based HVPS is attempted for the first time. A PSM based HVPS is developed with dual output to feed driver and end stages of a high power RF amplifier.

Developed dual output HVPS is capable of providing 14 - 18 kV, 250 kW to driver stage and 16-27 kV, 2800 kW to end stage of a RF amplifier chain. Present article covers the validation of dual output HVPS in integrated operation with RF Amplifier system. HVPS performance parameters viz. ripple, regulation and stability over extended duration of 3600 seconds are presented for various scenario of RF Amplifier operation. Implemented scheme for protection against over voltage and over current is discussed. Besides, short circuit test conducted at the output of HVPS is also presented with setup, demonstrating tight synchronization among both stages. Prescription of gauge, length for fuse wire followed to meet the essential energy limit qualifications

Eligible for student paper award?

No

Authors: Mr PATEL, AMIT (ITER-INDIA , INSTITUTE FOR PLASMA RESEARCH); Mr DHOLA, HITESH (ITER-INDIA , INSTITUTE FOR PLASMA RESEARCH)

Presenter: Mr PATEL, AMIT (ITER-INDIA , INSTITUTE FOR PLASMA RESEARCH)

Session Classification: W.POS: Poster Session W

Track Classification: Power supply systems