Contribution ID: **50** Type: **Oral Presentation**

DEVELOPMENT OF 3 MW DUAL OUTPUT HIGH VOLTAGE POWER SUPPLY FOR IC RF SYSTEM

Thursday, 7 July 2016 10:00 (15 minutes)

High Voltage Power Supply (HVPS) based on PSM (Pulse Step Modulation) topology has already demonstrated its ability for broadcast transmitters, accelerators of RF source, neutral beam injectors. Typical IC RF system composed of cascaded connection of Driver stage and End stage would need two power supplies. 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 anode voltage of Driver and Final Stage. This article discuss the development of HVPS, capable to provide 8-18 kV, 20 A to Driver Stage and 18-27 kV, 105-155 A to End Stage RF amplifier chain. Here dual output are controlled independently by single FPGA based PXI controller which support all pros of PSM based HVPS like low ripple , fast dynamics and fast switching off (<10 μs).

Discussed HVPS supports Non-Linear demand from IC RF system like lower current (105 A) at higher voltage (27 kV) and Higher Current (155 A) and Lower Voltage (18 kV), which developed as indoor compact solution. As an add-on specifications, HVPS facilitates 1 kHz RF power modulation. HVPS mainly composed of two numbers of Cast Resin Multi-Secondary Transformers, 48 numbers of Switched Power Supply (SPS) Modules, FPGA/Real Time based controller and other auxiliaries including passive protection devices. Present article describes technical details of HVPS Components, testing as per IEC standards. HVPS with Dual output is effective replacement, as it offers optimised solution for equipment bulk and economy as well.

Primary author: Mr PATEL, AMIT (ITER-India , Institute for Plasma Research)

Co-authors: THAKAR, Aruna (ITER-India); RAVAL, Bhavin (ITER-India); PARMAR, Darshan (ITER-India); UPADHYAY, Dishang (ITER-India); RATHOD, Harish (ECIL-India); DHOLA, Hitesh (ITER-India); MAHADEV, K (ECIL-India); APPARAO, N (ECIL-India); SINGH, Narinder Pal (ITER-India); GOSWAMI, Niranjanpuri (ITER-India); DAVE, Raesh (ITER-India); ATUPATLA, Rajakiran (ECIL-India); GAJJAR, Sandip (ITER-India); ATHAULLAH, Syed (ECIL-India); BARUAH, Ujjwal (ITER-India); GUPTA, Vikrant (ITER-India); MEHTA, kush (ITER-India)

Presenter: Mr PATEL, AMIT (ITER-India , Institute for Plasma Research)

Session Classification: Oral 6

Track Classification: Power Electronics and High Voltage