

Seismic Analysis Of High Power Amplifier in ITER ICRF Range

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ITER-India is responsible for delivery of 8+1(prototype) RF sources to ITER project. Each RF source will provide 2.5MW of RF power at VSWR 2:1 in the frequency range of 35 to 65MHz. Eight such RF sources will generate total 20MW of RF power. Two RF chains containing three high power amplifiers (HPA1, HPA2 and HPA3) need to be combined to build an RF source. HPA2 and HPA3 are RF tube based amplifiers while HPA1 is a solid state power amplifier. This paper covers detailed seismic analysis of High Power Amplifiers for worst case seismic loading condition.

A SL-2 seismic event has been analyzed to determine potential areas that will require inspection and/or replacement. According to the design basis, a Response Spectra Analysis (RSA) has been performed for the frames and cavity of high power amplifiers which includes the self-weight of all structural members, platform dead weight and reactions from the base. The RSA requires a modal analysis to be performed which is used to determine the rigidity of the support structures. The accelerations of the Zero Peak Acceleration (ZPA) are applied in order to account for all masses. All structures and components must respect the requirement that there must be no failure that would prevent a SIC-1 or SIC-2 component from performing its safety function.

The ANSYS software is used for Modal analysis and Response Spectrum analysis. This paper will also point out the maximum stressed link in structure and modifications may be proposed to achieve the required strength.

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