

Lifetime Prolongation of ICRF Generators, Theoretical and Conceptual Aspects

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The two ICRF generators for ASDEX and W7-AS have been designed almost 30 years ago [1] based on the available technology at the time. The more recent four ASDEX Upgrade generators are an evolutionary development. Today, the market doesn't provide anymore two of the three tetrodes used in those systems and spares are becoming scarce. Based on the long experience acquired with the initial configuration, a redesign process has been started with the main goal to prolong significantly the lifetime of the generators. Each of the four amplification stages needed to reach 2 MW of output power are undergoing a more or less important change. The most critical change concerns the final amplification stage and has already been successfully implemented [2], whereas changes of remaining stages are on going. The new first stage, while remaining solid-state based, provides a larger output power in order to drive the following (pre-driver) stage which is now triode rather than tetrode-based. The tube of the third (driver) stage is upgraded to a higher power dissipation capability, thus increasing the drive power for the fourth (final) stage. One of the two generators formerly used for ASDEX and W7-AS has been modified along those lines.

[1] W. Schminke et al., 10th SOFE, 1498-501 (1983).

[2] H. Fünfgelder et al., this conference