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Load and Pull Systems

Mohammed S. Hashmi and Fadhel M. Ghannouchi wrote a very intellectual journal called ñIntroduction to Load- Pull Systems and their applicationsò, the reason why I lead this article was because it was closely related to my Transmission System course and helped me further understand some subjects in the course. The article has been recognized as a great work because it was published in the IEEE Instruments and Measurement Magazine.

The way this relates in my class is that it help understand the smith chart methods and describes the applications of Load Pull Systems. From the article, I discovered that we can use a load pull system anywhere on a transmission line as long as it lays in the non-linear domain. It works great when we canô to optimize the performance of advice. In easier words to understand, a Load-Pull System is simply the term associated to the process of Systemically varying the impedance. This is good because we know that the impendence varies at any point in the transmission line; so. Load-Pull Systems act as a balance. To further the effectiveness of the Load-Pull System, it includes an active and also a passive impedance tuner.

The key difference in active and passive Load-Pull Systems is that passive has the rapid impedance synthesis rather than the active. The passive technique has the ability to handle higher power so it can measure high amounts of power with no non-linear affects. Also the passive

system has a very low maintenance cost and provides very little oscillation. But, the active system can synthesize reflection coefficients close to the boundary of the smith chart as, opposed to passive which is nearly impossible to synthesize the matching impedance. The active Load pull system is classified as either an open loop system or a closed loop system. An open loop system is much more complex and requires customs algorithms to obtain the desired reflection coefficient. The closed-loop system requires no such algorithms but because of its seemingly simplicity, it runs a higher risk of oscillations. From what I read in the article, the most popular passive system is the Pre matched Load-Pull.

Next thing I found interesting was the Hybric LP system. This system is a combination of both the passive system and the active load pull system. As explained in the article, the Hybrid LP system is designed to obtain the desired load-pull functionality. Since it is the best of both worlds, it satisfies all the measurements needed. Both the transformers in the system lower smith chart usage ∂/4 impedance transformers move the matched impedance from 50Ý to a lesser value. The ∂/4 impedance- transforming network has a bandwidth of about 51 to 10% of the Carner frequency, this prevents harmonic load pull. This limitation can be overcome by replacing to a Klopfenstein transformer. Latest development includes the enhanced loop passive load pull and the envelope load pull.

Finally, from what we read we can conclude that the load pull analysis is used to make a smith chart. From this we can determine the maximum power output achievable in a load impedance. It is very important to address these factors when viewing the actual impedance a device should get when used in an amplifier. The article showed the most popular load pull techniques and their advantages and disadvantages.