

A FEW MEASUREMENTS ON THE TIK

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During the October PS-stop, we were able to make a few measurements on the TIK. Unfortunately the time was not sufficient to get a coherent picture of what is happening in detail in the pulse generator. Magnetic measurements of course were not possible, they can only, and should be done during the annual shut down.

1. The current has been measured to be 990 A in all three modules for 60 kV PFN-voltage. At the operational voltage of 63,4 kV the current is 1050 A. With the calculated kick-strength of D. Fiander of 3.35 mrad for 1000 A in each module, one obtains an operational kick-strength of 3.5 mrad which is, as already mentioned in the TIK-appraisal of D. Fiander, not in good agreement with the measured kick of 3.2 ± 0.05 mrad at the same voltage in MPS/DL/Note 75-16. The error of our measurement is certainly not bigger than $\pm 2\%$. The reason for a 10% difference has yet to be found.
2. The line impedance of the PFN has been measured at low voltage. The value found is 10.4 ± 0.2 ohms. This is in good agreement with the value of D. Fiander.
3. The variation of PFN-voltage between the moment of measurement and the discharge is $\leq + 0.5\% - 1\%$.

4. There is no measurable non-linearity between the primary capacitor voltage and the digitized PFN-voltage indication.
5. The calibration of the voltage divider used for PFN-voltage measurement for operation against a precision Haefeli voltage divider shows a slight non-linearity at higher voltages, with the result, that the real voltage for an indication of 62.6 kV is in fact 2 - 3% lower. This result is in agreement with the linearity measurement between the magnet current and the indicated PFN-voltage, which gives an error of 2% due to non-linearity at 60 kV with respect to a measurement at 30 kV.
6. The droop of the magnet current pulse is found to be lower than 1% between 30 and 60 kV.

CONCLUSION

There is not a good agreement between our findings and those of the MST. The assessment of the TIK by D. Fiander gives a rather good picture of today's situation. However, the flat-top of the TIK pulse has been considerably improved since. We have some indications, that the thyatron switches are not working as good as expected. Unfortunately the available time was not sufficient for further investigation. Neither was there time for precise measurements of the pulse fall-time.

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