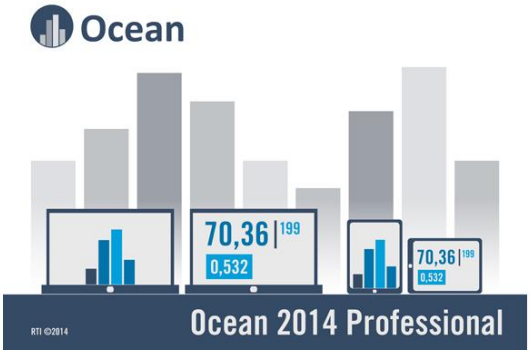
RTI From Radiation to Information

APPLICATION NOTE

Initial kV Adjustment in 3D Mammography

This Application Note gives an example on how the kV adjustment on a mammography generator can affect the use in pulsed mode on a 3D mammography machine.



Introduction

Below is an example from a support issue where the user of a Piranha claims that the tube voltage measurement is too high when measure on a 3D mammography unit.

Claim

The combination W/0,7 mm Al filter gives with the “zero” tomo situation **very High wrong kV and wrong HVL** results.
Example: 28 kV set gives 32 kV !!
The other combinations are alright. (W/ 50 umRh and W/ 50 umAg)
See the Ocean 2014 files
Everything done with position check

Answer:
Figure 1 below comes from the Ocean file supplied.
Have a look the shape of the kV waveform (red) as well as the dose rate waveform (green). The kV starts high and decreases within each pulse. Pulse length is about 25 ms.
Then look at the waveform data from a 2D exposure on W/Ag (Figure 2). There you can see that the kV (and dose rate) also starts high and reaches the target value after about 100 ms.
The conclusion of this is that the generator has an kV adjustment problem. This may have minor effect on a 2D exposure. But major on 3D with these short pulses, resulting in too high energy (kV) and thereby also higher HVL.

Figure 1

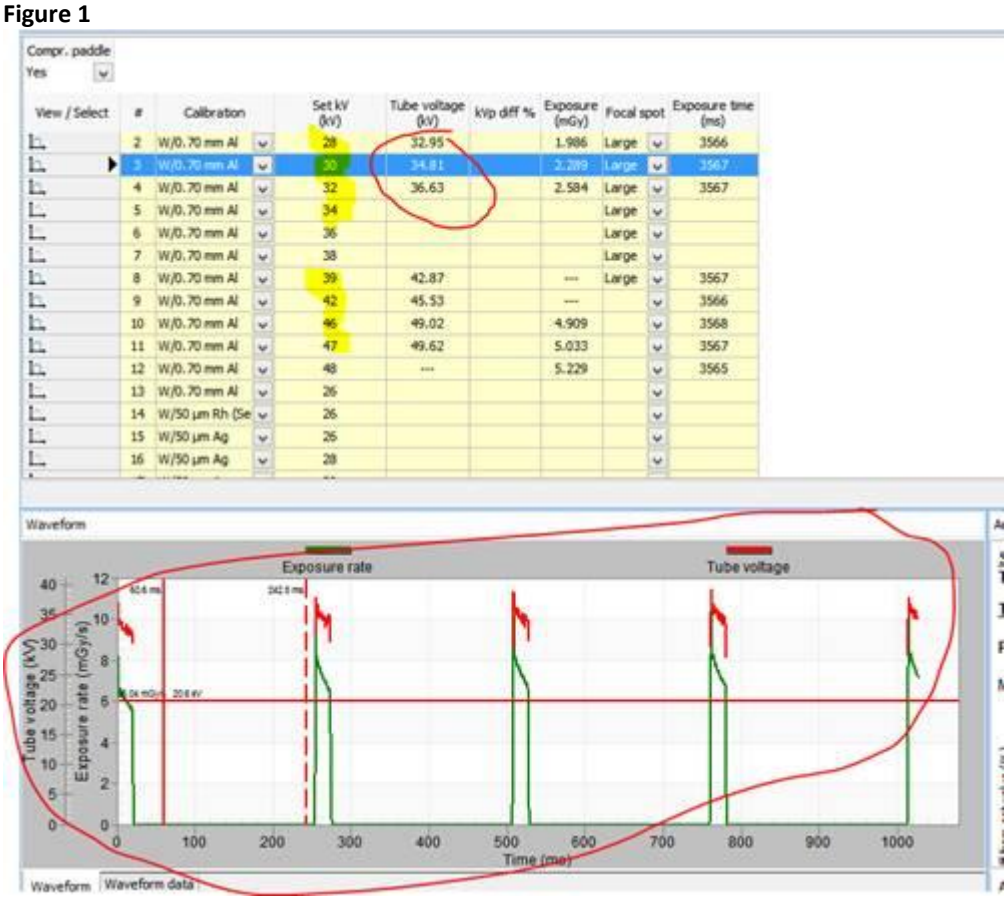
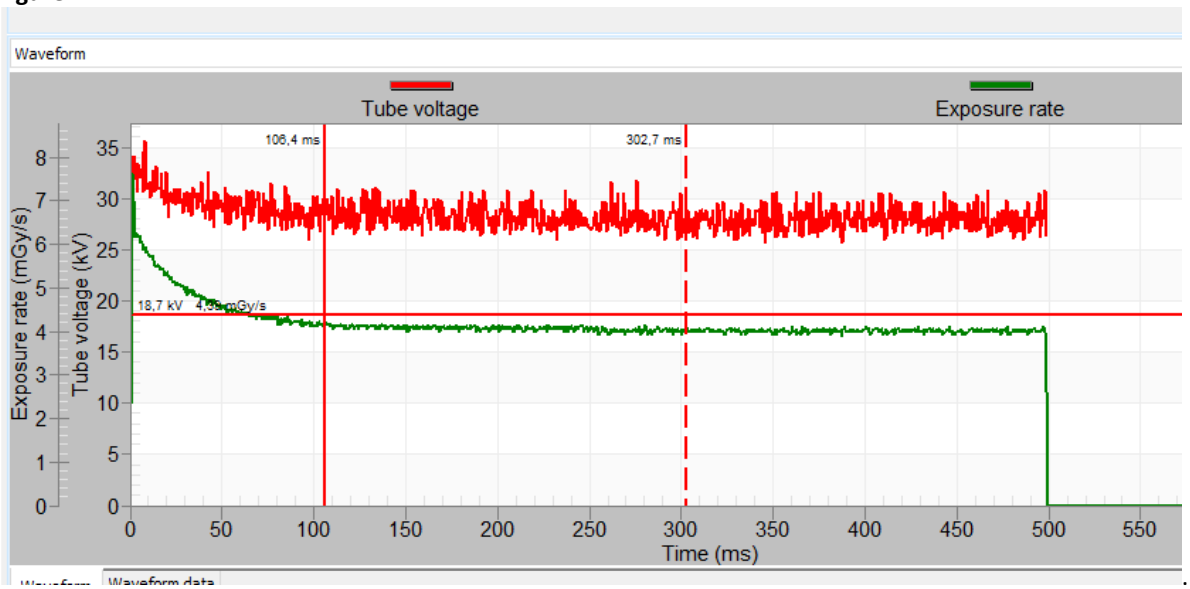


Figure 2



Summary

This in all is a good example on why the waveform data for every exposure is of such great value in the daily QA.

*** END ***