

3140

## Acceptance Testing of Diagnostic 5M-Pixels LCD Flat Panel Displays Based on the AAPM TG18 Protocol

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In June 2005, YUMC (Yonsei University Medical Center, Seoul, Korea) Severance Hospital upgraded a full-PACS system (GE Medical Systems, USA) by adding twenty (5 M pixels) and twenty-five (3 M pixels) flat panel liquid crystal displays (LCD) for diagnostic interpretation purposes. Here we report upon the quantitative acceptance testing of the twenty flat panel LCD devices of 5 mega pixels (Totoku Electric Co., Ltd., Japan) for reflection, luminance response, luminance spatial and angular dependencies, resolution, noise, veiling glare, and display chromaticity based on AAPM on-line report No. 03. The tools used included a telescopic photometer, which was used as a colorimeter, illuminance meter, light sources for reflection assessment, light-blocking devices, and digital TG18 test patterns. For selected 8 flat panel displays, 0.0016 cd/m<sup>2</sup> per lux. In  $\pm$ mean diffuse reflection coefficient (Rd) was 0.0188 the luminance response test, luminance ratio (LR), maximum luminance difference 100, 2.0 $\pm$ Lmax), and deviation of contrast response (Cont. of GSDF) were 550  $\Delta$ (1.77%, respectively. In the luminance uniformity test,  $\pm$  1.9%, and 5.84 $\pm$ 5.5% for the 10% luminance of  $\pm$ maximum luminance deviation (Non-unif.) was 14.3 the TG18-UNL10 test pattern. In the resolution test with luminance measurement 0.64%. In all cases of  $\pm$ L) at the center was 0.94 $\Delta$ method, percent luminance (noise testing, rectangular target in every square in the three quadrants was visible and all 15 targets except the small-est one in the every corner pattern 1994. The color  $\pm$ and the center pattern. The glare ratio (GR) was 12344 0.0008. All test results are in-line with the  $\pm$ (u',v'), was 0.0025  $\Delta$ uniformity, criteria recommended by AAPM TG18 report and are thus fully acceptable for diagnostic image interpretation. As a result, the acceptance testing schedule described provides not only an acceptance standard but also guidelines for quality control, optimized viewing conditions, and a means for determining the upgrading time of LCD display devices for diagnostic interpretation.

Keywords : Medical Display Device, AAPM TG18, Flat Panel Display