

Flat panel detector systems (FPD) have unique and different characteristics compared to fluoroscopy systems with image intensifiers and television cameras. These differences need to be properly evaluated during Acceptance Testing and routine Quality Control (QC) assessments. Because interpolation is used to fill-in voids, the number of non-functional detectors in the FPD array need to be identified and compared to the vendors' specifications. Although distortion is rarely present in FPD, non-uniformities and linear discontinuities need to be evaluated. Because of the dynamic range of FPD is large, clinically acceptable dose rates have an extended range and various software options for Automatic Brightness Control (ABC) settings are available. Measurements are required to determine the relationship between simulated patient thickness, pulse rate, Field of View (FoV), distance (SID) compensation and software parameters. The radiation dose influences the image mottle which is difficult to evaluate directly; Contrast-Detail assessments provide an insight into a reasonable range of radiation dose and image quality. Unlike image intensifier systems, FPD systems have a spatial resolution unaffected by FoV; however, the influence of the focal spot degradation with geometrical magnification should be measured. Software integrations and edge enhancements are operator selectable and need to be investigated. Extensive tests are required to evaluate display monitors because their settings (brightness and gray scale) plus window width and level settings are critical to good image quality. Electronic noise and jitter in the displays need to be examined. Finally, FPD usually demonstrate image persistence which needs to be checked with some type of temporally changing phantom. Other routine tests like x-ray beam alignments, kVp, waveform, and HVL and the contrast ratio should also be performed. The various evaluations are related to actual measurements performed on two different vendors' FPD including a cardiac bi-plane FPD unit in order to provide some anticipated typical values of parameters.