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Comparison of Automatic Exposure Control Logic of Full Field Digital Mammography and Screen-Film Mammography

The automatic exposure control (AEC) operation logic of a full field digital mammography (FFDM) system has been evaluated against the same make-and-model mammography system programmed for conventional screen-film mammography imaging. Various parameters associated with the AEC operation such as the tube potential "kVp", the "mAS", the anode target material, and the filter selection of the "test pulse", and the actual exposure were monitored as functions of the Plexiglas phantom thickness ranging from 1 cm to 8 cm.

The data obtained have clearly indicated the design principle of the mammography system that the AEC Logic for the FFDM tends to have a higher tube potential setup and is programmed to select the rhodium filter, and the rhodium anode target material at a thinner phantom thickness than the conventional mammography system logic. This is to compensate for the lower sensitivity of the image receptor utilized for the FFDM system.

Evaluation of the mid breast dose (based on two different screen-film combinations and the FFDM) and the image quality were conducted by the use of the ACR Mammography Accreditation Program Phantom (ACR MAP Phantom). Interesting results with respect to the mid breast dose and image quality will also be presented.