

The acceptance testing of Computed Radiography (CR) systems includes the calibration of the system response for a particular incident exposure. This response is given by a manufacturer-specific numerical indicator (i.e. Exposure Index or Sensitivity). During installation, this indicator is calibrated using protocols defined differently by each manufacturer. However, the results of the calibration process, as well as the acceptance testing, is dependent on several technical factors. These factors can be categorized into those related to experimental setup and the x-ray system characteristics. They include: i) kVp accuracy, ii) type of the generator (e.g., high-frequency, 3-phase), iii) amount of tube filtration (inherent and added), iv) exposure reproducibility, v) field size, vi) exposure measurement technique, vii) presence of back-scatter radiation, and viii) delay-time before reading the exposed phosphor screens. In this presentation, we demonstrate the relative influence of these factors based on experimental measurements. The CR systems tested are the Kodak KESPAR 400 and Fuji AC3CS. In addition, a computational model for the CR response which takes into account the x-ray system characteristics is used. Our results indicate that more than 50% deviation can be attributed to these factors. Based on these results, we recommend a technique which varies from the manufacturer's protocols but provides a more accurate and reproducible exposure calibration of CR imaging systems.