AbstractID: 1313 Title: A Review of Control Methods for CT Automatic Exposure Control Systems

Automatic Exposure Control (AEC) systems for CT are rapidly gaining widespread clinical use. These systems reduce patient dose by allowing the CT system to determine an mA for the patient that is necessary to achieve a specified image quality (IQ). Clinical studies are beginning to show that AEC methods reduce the dose by about 35% compared to fixed mA protocols. AEC allows lower mA levels to be used because it minimizes the risk of inadequate IQ due to patient variability. Fixed mA protocols tend to use higher dose overall to avoid the risk of compromised images when encountering larger patients.

A fundamental consideration for an AEC system is how the user specifies the desired IQ. Presently there are a number of different methods in use. These methods include specifying an image noise (GE Noise Index), a pseudo mA for a predefined nominal patient, an arbitrary IQ scale (i.e. good , better, best), an image signal to noise ratio, the direct specification of a desired dose and a variety of other variations. The use of different methods increases confusion among technologists, makes it more difficult for clinical researchers to compare IQ and dose trade offs, and increases the difficulty in transporting clinical protocols between CT systems from different manufacturers.

In this paper we review the control principles of AEC systems for CT and discuss the advantages and disadvantages of various methods. We concluded that developing a standardized approach for the user would benefit the CT medical community.