MANDATORY APPENDIX VIII
RADIOGRAPHY USING PHOSPHOR IMAGING PLATE

VIII-210 SCOPE

This Appendix provides requirements for using phosphor imaging plate (photostimulable luminescent phosphor) as an alternative to film radiography.

Radiography using phosphor imaging plate may be performed on materials including castings and weldments when the modified provisions to Article 2 as indicated herein and all other requirements of Article 2 are satisfied. The term *film*, as used within Article 2, applicable to performing radiography in accordance with this Appendix, refers to phosphor imaging plate. ASTM E2007, *Standard Guide for Computed Radiography*, may be used as a guide for general tutorial information regarding the fundamental and physical principles of computed radiography (CR), including some of the limitations of the process.

VIII-220 GENERAL REQUIREMENTS

VIII-221 PROCEDURE REQUIREMENTS

(19) VIII-221.1 Written Procedure. A written procedure is required. In lieu of the requirements of T-221.1, each procedure shall include at least the following information, as applicable:

(a) material type and thickness range
(b) isotope or maximum X-ray voltage used
(c) minimum source-to-object distance (*D* in T-274.1)
(d) distance from source side of object to the phosphor imaging plate (*d* in T-274.1)
(e) source size (*F* in T-274.1)
(f) phosphor imaging plate manufacturer and designation
(g) screens used
(h) image scanning and processing equipment manufacturer and model
(i) image scanning parameters (i.e., gain, laser resolution), detailed, as applicable, for material thicknesses across the thickness range
(j) pixel intensity/gray range (minimum to maximum)

(19) VIII-221.2 Procedure Demonstration. A demonstration shall be required at the minimum and maximum material thicknesses stated in the procedure. Procedure demonstration details and demonstration block requirements are described in Supplement A of this Appendix.

VIII-225 MONITORING DENSITY LIMITATIONS OF RADIOGRAPHS

The requirements of T-225 are not applicable to phosphor imaging plate radiography.

VIII-230 EQUIPMENT AND MATERIALS

VIII-231 PHOSPHOR IMAGING PLATE

VIII-231.1 Selection. Radiography shall be performed using an industrial phosphor imaging plate capable of demonstrating IQI image requirements.

VIII-231.2 Processing. The system used for processing a phosphor imaging plate shall be capable of acquiring, storing, and displaying the digital image.

VIII-234 FACILITIES FOR VIEWING OF RADIOGRAPHS

Viewing facilities shall provide subdued background lighting of an intensity that will not cause reflections, shadows, or glare on the monitor that interfere with the interpretation process.

VIII-260 CALIBRATION

VIII-262 DENSITOMETER AND STEP WEDGE COMPARISON FILM

The requirements of T-262 are not applicable to phosphor imaging plate radiography.

VIII-270 EXAMINATION

VIII-277 USE OF IQIS TO MONITOR RADIOGRAPHIC EXAMINATION

VIII-277.1 Placement of IQI(s). When using separate blocks for IQI placement as described in T-277.1(a), the thickness of the blocks shall be such that the image brightness at the body of the IQI is judged to be equal to or greater than the image brightness at the area of interest for a negative image format. If verified by measurement, pixel intensity variations up to 2% are permitted in the determination of “equal to.” This image brightness requirement is reversed for a positive image format.

(b) All other requirements of T-277.1 shall apply.