

SUCCESSFUL CONVERSION FROM FILM TO COMPUTED RADIOGRAPHY

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ABSTRACT

Digital Radiography using storage phosphor plates is known as "**Computed Radiography**" or CR for short. This "film-less" technique is an alternative for the use of medium to coarse-grain X-ray films. In addition to having an extremely wide dynamic range compared to conventional film, CR-technique is much more sensitive to radiation, thus requiring a lower exposure dose. This results in shorter exposure times and a reduced safety area.

In addition to the reduced cost on consumables, the return on investment of CR systems is strongly determined by savings in exposure time, processing times and archival times. But also intangible costs like plant shutdown, environment safety and longer usability of isotopes are increasingly important when considering replacing film by Storage Phosphor systems.

More than in traditional radiography, the use of digital images is a trade-off between the speed and the required quality. Better image quality is obtained by longer exposure times, slower phosphor screens and higher scan resolutions. Therefore, different kinds of storage phosphor screens are needed in order to cover every application.

Most operations have the data, associated with the tests to be performed, centrally stored in a database. Using a digital radiography system gives not only the advantages of the manipulation of digital images, but also the digital data that is associated with it. Smart methods to associate cassettes and Storage screens with exposed images enhance the workflow of the NDT processes, and avoid human error. Automated measurements tools increase the throughput in different kinds of operations.

During the fall of 2005, the ASTM 2445/2446 and the European Standards EN 14784-1/2 have been published after long years of discussion. The standards describe a measuring method and a classification for CR systems, together with the different test classes in function of the material thickness and used energy. These publications broaden the application field of Computed Radiography. One of the applications waiting for standardization is the radiographic inspection of welds. Weld inspections cover more than half of the applications in the oil and gas market, and replacing film by Computed Radiography would bring total cost savings to the inspection company.

This presentation gives an overview of the current status of the CR Technology, the CR standards and some successful applications. It describes the different aspects of a radiographic system, including the requirements of the hardware, the different kinds of

storage phosphor screens, the software and the workflow in general. Finally it demonstrates that the standards can be met with the most modern CR technology and it presents some image quality results.