The Value of DICONDE

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Abstract:

DICOM driven from the medical industry has greatly advanced how hospital communicate and the way in which they operate. The evolution of DICONDE from DICOM now provides the NDT industry with an imaging protocol communication standard and protects the value of inspection data taken today or in the future. As an ASTM standard, DICONDE will stand as the imaging communication protocol, and as the industry continues to drive to make both DICONDE complaint hardware and software issues concerning backward compatibility of data will become a thing of the past. With DICONDE inspection data now inspectors can look at inspection data from different modalities within the same system, operate one software platform with various DICONDE complaint hardware, and protect the integrity of inspection data. The DICONDE industry standard moves inspectors, engineers, and operations from looking at just an image to a whole new way of inspection data communication and management.

keywords: DICONDE, inspection, Radiography, Visual, UT, standards

History

The early development of software to process and transfer radiographic images was carried out in the medical field. This resulted in the creation of the DICOM standard (Digital Imaging and Communication in Medicine). Healthcare carried much of the pioneering work out over the past 12 years and virtually every medical profession that utilizes images and is the accepted image and data transfer protocol now uses DICOM.

DICONDE

The industrial sector has now benefited from this pioneering work in the medical field with the development of DICONDE (Digital Imaging and Communication in NDE). This relies very much on the DICOM protocol but incorporates many structures, which are purely NDE- focused. ASTM released the first version of the DICONDE standard in 2004.

Essentially, DICONDE is a dictionary that describes all the necessary syntax, attributes and data elements to allow users to acquire, store, archive, transmit and receive image data in a way that is universally compatible. It is a system that allows images to be saved with its meta-data, in that all the technique information and information on location, date and time and inspector is saved with the image. Such information can then

be included in any report generated, while its inclusion with the image into databases means that database searches can be carried out on a variety of criteria.

Moreover, DICONDE images can be included on a disk with a standard DICONDE viewer, which allows them to be displayed on any standard PC.

Hierarchy

The DICONDE format itself organizes the data in a way that creates a hierarchical, systematic structure for the data. Following the DICOM standard, data is organized in Study, Series and Instance hierarchy. Allowing inspections to be grouped and categorized within a system.

DICONDE Hierarchy

Study Component ID, Component Name, Study ID, Serial #, ...

    → **Series** Typically based on date/time stamp,
                                     Series Description, ...

        → **Instance** Image or Data

Inspection Example

Study MyPart123, Casting, 20080403, 123-ABC

→ **Series** 20080112, Ser1

    → **Instance** Tech1, Side, 90 kV, 3 mA, 5 sec

    → **Instance** Tech2, Top, 80 kV, 4 mA, 5 sec

→ **Series** 20080403, Ser2

    → **Instance** Tech1, Side, 90 kV, 3 mA, 5 sec

    → **Instance** Tech2, Top, 80 kV, 4 mA, 5 sec

In this inspection example, you see that a Component might be inspected once on one day and then again with the same Component information at a later date. The DICONDE formatting helps organize this data hierarchically, so when you pull back that Component in a DICONDE system you get one Study, but see both times that it was inspected as two separate Series within that Study.

Value of DICONDE

So how is the value of DICONDE realized?

DICONDE compliancy ensures that operators are not limited by current proprietary formats, eliminating the need for future data conversion and simplifying data integration from other ndt information sources, such as pipe management databases. This ensures that customers can choose the best in breed hardware and software platforms while always ensuring the reliability of their data and its format.

DICONDE based software platforms also allows one to manage all inspection data; Radiograph, Visual, Ultrasonics, Eddy Current, etc on one platform and allows quick efficient sharing of inspection data and information.

The phrase a picture is worth a thousand words comes true with DICONDE; the image and all the key information about that asset and inspection is stored right with the image. This provides a standard structure for querying on images and opens up the opportunity for advanced trending and data analysis based on inspection history ultimately leading to better asset management and improved asset uptime.