



## **Development of Distributed Ultrasonic and Eddy Current Systems**

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### **Abstract**

The potential of computerization of NDT systems has not been utilized to the full extent. Initially, the advance in digital electronics and powerful desktop PCs has lead to NDT systems to be integrated in stand alone computer based NDT systems. Basically the structure of NDT equipment has not changed and the analog electronics have only been replaced by digital components. This may have also improved the stability, precision and accuracy of these digital NDT systems. A major advantage has been the ability to store data of large volumes for archiving, documentation and later evaluation. However, the ability to control equipment and transfer test data in real time over computer networks have hardly been used.

We have developed software for digital NDT systems that can be used in multi-user and multi session environments. Client Server Technology is the basis of these developments. The usage can be classified in two ways:

A One to many environment.

This situation can be best used in a class room or teaching situation. A single server NDT (MFEC eddy current and PCUS ultrasonics) equipment broadcasts the data to client PCs. Each client has the ability to interact with the server, i.e. by setting testing parameters and receiving data. In this way, the system can be used for teaching with multiple client PCs. The permission to interact with the server can be given from a master PC by an instructor as required.

The scheme, one instrument, many clients, can also be used for displaying ongoing ultrasonic or eddy current test to multiple viewers away from the testing site. This may be required if the test site is hazardous or if an expert for evaluation is not available on site. The network can be a wireless network using standard local area network (LAN) technology. The testing session can be transmitted live through the internet as well.

Many to one environment

Manly for multiple automated NDT testing stations it is required that test data are monitored periodically. We have implemented a multiple server platform that can be monitored by a single PC client. One NDT operator is thus enabled to supervise ongoing tests on a his central PC connected to a local area network. This scheme is best suited for multiple automated NDT test stations. Our system operates in a railway wheel testing station that operates four independent ultrasonic testing machines.

Distributed NDT systems have thus changed the way the NDT technology can be employed. The few examples presented are only giving a glimpse of the possibilities that have opened up.