What are the Influencing Factors on Inspection Performance of UT Testing on the Wheel Set Hollow Axle in the Context of Education and Brush Up Examination?

Thomas HECKEL*, Marija BERTOVIC*, Tobias DOBBERPHUL*, Daniel KANZLER*, Christina MÜLLER*, Martina ROSENTHAL*, Ralf HOLSTEIN**, Fred SONDERMANN***
* BAM Bundesanstalt für Materialforschung und -prüfung, Berlin, Germany
** DGZfP Ausbildung und Training, Berlin, Germany
*** DGZfP Ausbildung und Training, Wittenberge, Germany

Abstract

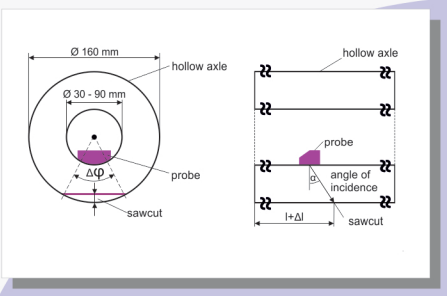
About 500 examination results of manual UT testing on hollow axles of wheel sets with artificial and natural flaws were compared with a sophisticated phased array reference investigation and the mechanical measured flaw data and evaluated statistically. The aim of the investigation is to improve the training and the set up of examinations. The POD and the variance of echo amplitudes are analyzed with respect to the parameters of the ultrasonic probe used and the age and experience of the inspectors and also the number of recertification examination. The future investigation should focus on the factors, identified during this investigation, which influence the inspection quality and decrease variation in the inspection results, as well as provide with recommendations on how to improve the education of the operating personnel. A comparison of results from manual and mechanized testing of the wheel sets hollow axles provides a hint how to make this type of testing more reliable.

What are the Influencing Factors on Inspection Performance of UT Testing on the Wheel Set Hollow Axle in the Context of Education and Brush Up Examination?

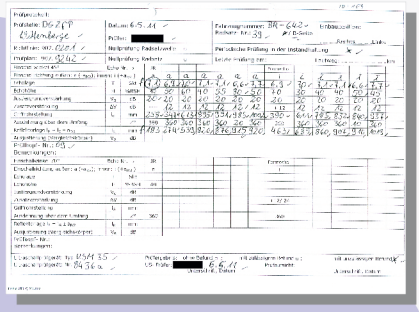
T. Heckel, M. Bertovic, T. Dobberphul, D. Kanzler, C. Müller, M. Rosenthal, BAM, Berlin, Germany
R. Holstein, DGZfP Ausbildung und Training, Berlin, Germany
F. Sondermann, DGZfP Ausbildung und Training, Wittenberge, Germany

About 500 examination results of manual UT testing on hollow axles of wheel sets with artificial and natural flaws were compared with a sophisticated phased array reference investigation and the mechanical measured flaw data and evaluated statistically. The aim of the investigation is to improve the training and the set up of examinations. The POD and the variance of echo amplitudes are analyzed with respect to the parameters of the ultrasonic probe used and the age and experience of the inspectors and also the number of recertification examination. The future investigation should focus on the factors, identified during this investigation, which influence the inspection quality and decrease variation in the inspection results, as well as provide with recommendations on how to improve the education of the operating personnel. A comparison of results from manual and mechanized testing of the wheel sets hollow axles provides a hint how to make this type of testing more reliable.

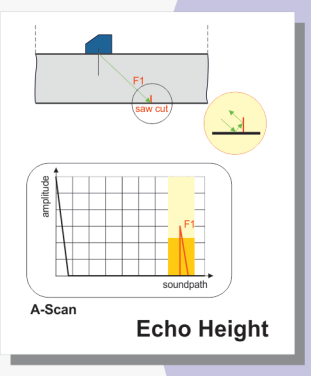
Setup for Manual Inspection



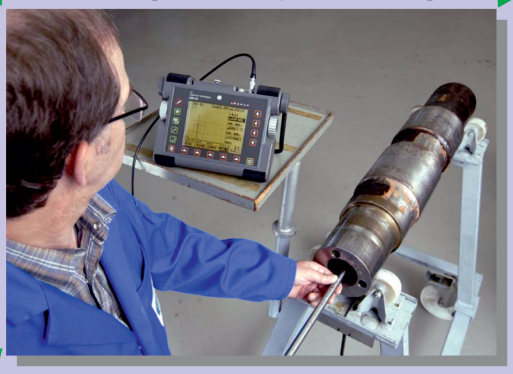
Example Inspection Record



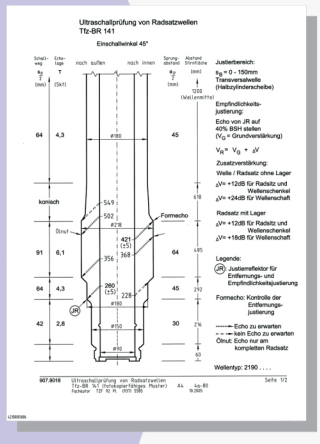
Main Parameter



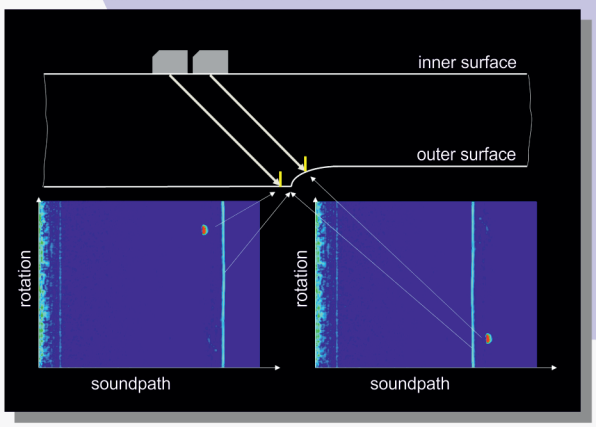
Training Workshop Wittenberge



Inspection Plan



Mechanized Reference Measurements



Result: Measured Amplitude and Size