Monitoring NDE with non contact tracking to support operator during manual inspection of a part

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During a Non-Destructive Evaluation (NDE), the performance of the processes and the reliability of the results are critical. Manual NDE techniques are important in the industry because they can be deployed at low costs and quickly unlike mechanized or robotic acquisitions. However, during a manual inspection, the location and orientation of the probe on the part is generally not recorded by the system; the quality of the inspection is then based on the controller's skills and the operational conditions under which the control is carried out. On-site, the compliance of the control with the procedure, or laterfurther analysis of the compliance of the inspection cannot be performed due to this lack of recorded information. To compensate for these weaknesses, an easy to use and non-intrusive system using optical devices, to monitor and record the position of the ultrasonic probe has been developed. It has been first used in the french ANR project FOEHN where the goal was to understand and predict the impact oh so-called “human factors” on the quality of a manual UT inspection. This system can bring as well an improvement in the conditions for deployment on the field by displaying contextual information in augmented reality (RA). We will present a dedicated development to record the position and orientation of the probe during a manual UT inspection based on commercial devices: after an interactive initialization phase on the component under inspection, the device performs 3D tracking of the probe during the inspection, and allows real-time visualization of the zone coverage performed. Specific display tools also makes it possible to respect constraints set in terms of speed of movement and orientation of the probe relative to a geometric part of the component as for example the axis of a weld. Then the recording of the positioning data of the probe during the control provides the guarantee of the good performance of the inspection.