

Using the latest online ultrasonic monitoring systems to improve refinery maintenance and operation productivity

William Vickers¹

¹Products, Ionix Advanced Technologies Ltd, United Kingdom

Online, non-intrusive corrosion and erosion monitoring systems that utilise ultrasonic transducers are becoming an increasingly popular tool to enable operations and maintenance teams to enhance process unit productivity and efficiency whilst not compromising on safety. Traditionally, internal corrosion of assets would be monitored by a combination of invasive probe methods, such as coupons or electrical resistance (ER) probes, and non-invasive NDT techniques such as non-destructive testing (NDT) with ultrasound transducers or other devices. Now, a range of automated ultrasonic monitoring solutions have come to the market which provide enhanced data outputs enabling up-to-date, robust and reliable thickness and corrosion measurements to be autonomously collected and transmitted. Like all emerging technologies, a thorough understanding of the strengths and also shortcomings of these automated integrity monitoring systems is required to deploy them onto sites in such a way that they provide the required data, in the correct form and the at the location that maximises accessibility and availability. Presented here is a review of how the latest installed ultrasonic monitoring systems are being deployed for asset integrity and corrosion monitoring with a focus on the challenges faced when implementing these systems for the first time and their ongoing operation. A number of case studies will be presented and critiqued including applications in upstream and downstream production and chemical processing with the aim being to share the feedback and learning from these recent successful applications of this exciting new technology. This review will be of interest to all inspectors, integrity and corrosion engineers and plant managers who wish to improve their understanding and knowledge of automated ultrasonic integrity and corrosion monitoring and apply it to their processes and plants. The collection and storage of data will first be explored and will consider the environment, local hazards such as explosive gasses and high temperatures (up to 550°C), installation, data transfer and finally data storage. Secondly, the continued generation of meaningful measurements and this use of all this valuable data will be reviewed. The focus of this article is on refining and downstream oil & gas production, but the principles apply across the oil and gas and petrochemical industry and also to the energy (including nuclear and fossil fuel) and process control.