

## **Pipe Irregularities Mapping Using Tomographic Instrumentation System**

### **ABSTRACT**

Formation of irregularities on the inner surface of pipes is a common phenomenon that leads to corrosion and affects the functionality in the processing industries. Ultrasonic is known as one of the non-destructive means to address the formation of irregularities inside pipes. In this study, an ultrasonic measurement system is developed to detect the presence of internal irregularities in a pipe. An ultrasonic sensor EFC16T/R-2 with a frequency of 40 kHz was mounted outside the test pipe with a circular ring sensor unit. Different conditions of the inner pipe surface had caused fluctuations of the ultrasonic signal. The results show a low output voltage in the range of 2.1333 to 3.1334 V when no irregularities were detected. A higher output voltage was observed in the range of 5.4677 to 8.8667 V when irregularities occurred. The reconstructed images of irregularities had matched the actual condition of the pipe. Some images showed a slight inaccuracy of the position of the irregularities caused by the instability of the ultrasonic signals. Overall, the developed ultrasonic tomography is suitable as a tool for monitoring irregularities in a pipe.