

# **Development of Digital Radiography Testing Automation System Using Bendable Digital Detectors**

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Among non-destructive inspections of structure welds at industrial sites, digital radiography testing replaces film radiography testing used in the past, and the application of industrial sites is gradually increasing. However, since a digital detector is used rather than a film, it is difficult to actively apply it in industrial sites because there is no standard for exposure time to satisfy the flexibility of the film and the quality of the image during radiography. In this experiment, a digital radiography testing system was automated using a recently developed bendable detector and a movable RT Room. A cooperative robot was placed inside the RT Room and a radiation source and a bendable detector were connected to the robot arm, respectively, to minimize the access of inspectors to the RT Room. In addition, the entire process of radiography testing was established as an automated system, ranging from photographing arrangement and photographing required for digital radiography testing, automatic arrangement according to the photographing section, and primary defect reading through artificial intelligence. To check the performance of the established automation system, digital radiography tests were conducted with pipes with an outer diameter of 1-6 inches, including welding parts, and images were obtained to confirm that they were satisfied with the reading criteria, and the possibility of field application was evaluated.