

# **Rapid detection and sizing of corrosion under pipe supports (CUPS) using a novel guided wave approach**

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Corrosion under pipe supports (CUPS) poses a significant threat to the safe operation of aging pipelines in the petrochemical and power generation industries, used for transporting hazardous products. The failure to inspect and maintain these pipelines can lead to detrimental consequences. While the need for effective non-destructive evaluation (NDE) methods to detect CUPS is apparent, the current options available are limited. Recent advancements in short-range guided waves, assisted by Machine Learning algorithms, have significantly improved the capability of current GW technology, enhancing the potential for accurate and remote sizing of defects. This paper introduces a practical inspection approach for CUPS that combines the well-established long-range guided wave testing (GWT) with this novel short-range guided wave (GW) technique. Long-range GWT allows for quick screening of extended pipeline sections, including support locations, providing an immediate overview of the pipe's condition within the test range. Once CUPS is identified, short-range GW is applied to extract quantitative dimensions and morphology of targeted defects, enabling remote sizing of CUPS. Such knowledge is a prerequisite for the Fitness for Service Assessment. The proposed inspection approach offers rapid detection and quantitative sizing of CUPS, facilitating efficient and timely maintenance decisions. This paper presents the advantages of this innovative inspection approach and showcases the results of recent on-site inspections through compelling case studies.