

How Hard are Your Hard Spots? A Deep-Dive into the Subjective Nature of Hardness Measurements

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Hard spots in pipelines have been historically associated with multiple failures. Although assessment of hard spots is a critical aspect of integrity management of pipelines, several aspects of the detection, identification, measurements, and evaluation of hard spots have posed continuing challenges for the industry. One of the fundamental issues that forms the bedrock of integrity management approach for hard spots is the uncertainty in the measurement and interpretation of the hardness values associated with hard spots. Indeed, what cannot be reasonably measured cannot be effectively managed. The aim of the paper is to discuss interpretation of hardness data in light of measurement techniques, tools, procedures, statistical variation, and characteristics of hard spots. The paper will highlight multiple perspectives that will provide a more complete understanding of hardness measurements towards comprehensive integrity management of hard spots.

The paper will focus on a case study that will include the findings from the examination of a set of recently excavated hard spot features in 30 inch A.O. Smith pipe. Specific results from in-the-ditch NDE activities, and detailed laboratory-based examinations will be presented and interpreted. Results will be discussed in light of potential improvements for increasing confidence in the in-the-ditch hard spot evaluation techniques. The findings and recommendations discussed in the paper will be practical and can be readily implemented by operators and NDE vendors for better management of hard spots going forward.

#248 is an abstract only. No paper.

