**Cased Crossings & Guided Wave Ultrasonics: Regulatory Drivers**

In 2002 and 2004, PHMSA promulgated new regulatory requirements targeting hazardous liquid and natural gas transmission pipelines in HCAs. The majority of hazardous liquid pipeline miles in HCAs can be inspected by in-line inspection or smart pigging. Because of this, the focus on assessing cased crossings shifted to unpiggable natural gas pipelines. Natural gas IM regulations apply to gas transmission operators jurisdictional to 49 CFR Part 192. These requirements became effective February 14, 2004.

Essentially, 49 CFR Part 192 requires the integrity assessment of all line pipe in HCAs. If line pipe is in a casing within an HCA, it must be assessed in accordance with the specified requirements. The requirements list the methods approved for conducting an assessment under 192.921(a)(1-3). The list is limited to In-line Inspection, Pressure Testing, and Direct Assessment and “other technology” such as guided wave ultrasonics. To use an assessment methodology other than these 3 methods, you must provide a "180-Day Notification" as specified under 192.921(a)(4) – “other technology”.

Another regulatory driver comes from the incorporation of the NACE International Standard Recommended Practice RP0502-2002, Pipeline External Corrosion Direct Assessment (ECDA) Methodology into PHMSA’s Part 192 gas transmission pipeline requirements. The ECDA methodology is supported by the availability of several indirect inspection methods such as close-interval surveys, Alternating Current attenuation surveys, Direct Current and Alternating Current Voltage Gradient surveys, Pearson surveys, and Cell-to-cell surveys. Tools and methodologies continue improving for addressing hard to evaluate areas. These areas are stated in the ECDA process as pipe in casings, underwater crossings, pipe in corridors with electrical interference (electrified railways and high voltage lines), as well as pipe beneath pavement.

The NACE International ECDA standard proscribes how to conduct a feasibility assessment and the selection of indirect assessment tools for cased pipe. Table 2 in the standard provides the guidance for selecting indirect inspection tools and specifically addresses conditions under which some indirect inspection tools may not be practical or reliable. Unfortunately, all listed indirect inspection tools in Table 2 are classified as not applicable or not applicable without additional consideration for casings.

Outside of using In-Line Inspection or Pressure Testing, these facts illustrate there is not one single, reliable technology or assessment method recommended by NACE and allowed by PHMSA to assess all the different circumstances found with cased crossings.