STEM-Corrosion™

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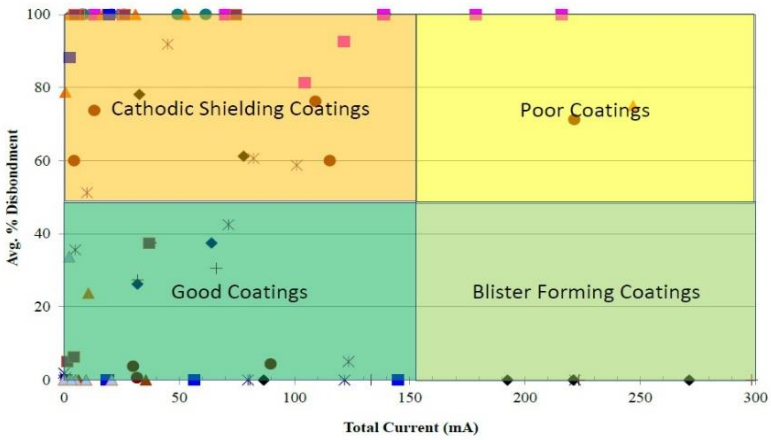
Ask Right Questions at Right Time to get Right Products



Oil and gas industry traditionally relies on inline inspection (ILI) data. ILI is a trailing indicator, i.e., it provides information on corrosion, and cracking only after they have resulted in material loss or material integrity.

To lead corrosion control the industry should focus on "leading indicators". Leading indicators provide insight on "what might happen" in the future rather than "what (and how it) might have happened" in the past. To establish leading indicators the industry should ask right questions before the operations start, not in between operations or after failures. One such question is: what is the relationship between cathodic disbondment and current demand in cathodic disbondment (CD) test?

CD test is extensively used to evaluate compatibility between polymeric coating and cathodic protection. During the test, current is applied to maintain the potential of the coated steel panel at a selected potential, typically -1.5 V Vs copper-copper sulfate (CCS) reference electrode. After certain period, typically 28 days, the test is terminated to determine the extent of coating disbondment. Criteria for the allowable disbondment are established by various standards making organisations such as ASTM International, AMPP, CSA group, and ISO.

However, the standards are inconsistent on the requirement of measuring current during the CD test; some "optionally" require current measurement during test whereas some don't. Besides standards don't provide guidelines on how to use the current value if measured.

Research (Materials Performance, Vol. 60 (1), P. 28-32, 2021) has indicated that from the relationship between CD current and CD area of disbondment, the coatings may be broadly divided into four (4) types: good coating, poor coating, cathodic shielding coating, and blister forming coating. Though the boundaries between the four (4) types of coating in the CD test need to refined and standardized, such data will be "leading indicator" of coating behavior. Perhaps if the question "what is the relationship between CD test area and CD current demand" was asked in 1980s, some of the high-profile accidents due to near-neutral pH stress corrosion cracking (SCC) on polyethylene-coated pipelines might have been predicted before they happened and might have even be prevented.

Raising Star of This Newsletter:

Reena Sahney

My Story

I am a mechanical engineer with a master's degree in non-destructive testing as well as an MBA. A born and raised Calgarian, most of my work experience has been based in western Canada but I have been fortunate enough to have lived and worked in the UK and had opportunities to collaborate with colleagues globally – particularly in the US and Australia. My career started within pipeline integrity at a pipeline operating company, before I moved on to an international consultancy then returned home to work in a post-secondary environment – eventually launching **Jiva Consulting**.

Jiva is a boutique educational consultancy that has found a niche focused on transferring deeply technical knowledge in an effective way. In addition to traditional methods of knowledge transfer, such as online or classroom-based learning, Jiva also specializes in competency management and other job aids, and has even explored more innovative approaches such as using podcasts to learn from incidents.

My Style

As Jiva will be ten years old this year, I have paused to reflect on my journey to this point and the tremendous group of people that I have collaborated with over the years. Whether it is the recognition of receiving the Outstanding Contribution & Achievement Award from the CEPA Foundation in 2020, or more recently working with an Australian industry association to support the adaptation and launch of a competency management system for the pipeline industry in Canada, I am proud of the contribution that I have been able to make within the industry. Some of these contributions include the development of key documents relating to pipeline and facilities construction inspection, which have become central to industry wide API certifications, to work on a number of initiatives with ASME and NACE and their first two documents on inline inspection – both the state of the art report as well as the recommended practice.

Things That Excite Me to Continue in the Industry

At every point on my journey, I have been fortunate to have worked with talented and supportive people who have not only been open to but have encouraged diversity of thought and approaches to some of the most difficult problems in the industry. And, as I look forward at some of the challenges we are facing now, it is this very same openness and willingness to look at things differently that gives me hope that our industry will continue to evolve and carve a path in an economy that is increasingly pressured to decarbonize. I am excited to be part of meeting that challenge!

Changes I would Like to Make in the Industry

In addition to traditional methods of knowledge transfer, such as online or classroom-based learning, it is time for industry to focus on competency management and other job aids.

Advice to Attract Youngsters to the Industry

Continue to encourage openness and willingness to look at things differently that would help our industry will continue to evolve and attract diverse youngsters.