STEM-Corrosion™

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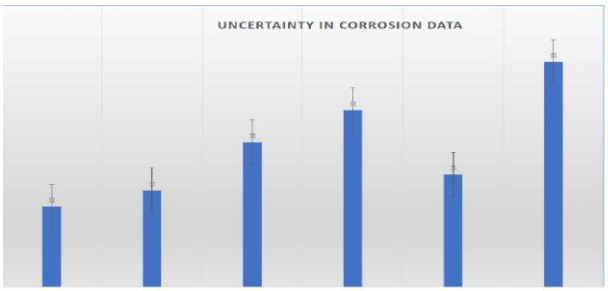
Does Sun Rise in the East?



Sun rises exactly from east only twice a year - on Equinox days! Other days, it rises from slightly northeast or southeast. So, when we say Sun rises from the east there is an element of uncertainty. The error is maximum on solstice days when the Sun rises furthest from east, i.e., southeast or northeast!

Similarly, corrosion data from laboratory or field have certain amount of uncertainty. The extent of which depends on the reliability of field measurements, laboratory methodologies, ability of the person making the measurements and so on. This uncertainty depends on "repeatability" or "reproducibility" of the measurements:

- Repeatability is the variation associated with same measurement repeatedly made by the same person.
- Reproducibility is the variation associated with same measurement made by different persons.

The uncertainty may be expressed as standard deviation or percentage deviation. In ILI data, for example, the uncertainty may be expressed as ± 10% accuracy at a confidence level of 80%.

Corrosion data presented without standard deviation or percentage deviation is questionable. Using such data is dangerous. Models based on such corrosion data will lead you in the wrong direction.

Localized pitting corrosion prediction software such as **iFILMS™** expresses the uncertainty as percentage deviation and is based on repeat laboratory measurements (determined by carrying out the tests in triplicate) and on repeat field measurements (determined by repeatedly measuring depths of 144 pits by ultrasonic probes over a 4-year period). The actual localized pitting corrosion rate is more likely to be within range of percentage deviation predicted by iFILMS™.

Top Influencer of This Newsletter:

Dharma Abayarathna

My Story

I started my career as a physicist. My love for science began in my homeland, Sri Lanka, where I completed my B.Sc. degree from the University of Peradeniya.

I continued my studies in the United States and earned my Ph.D. in physics with emphasis in materials science from the Missouri University of Science and Technology.

During my exploration of materials science, I naturally gravitated towards corrosion and its control. My interest in corrosion grew due to the hands-on nature of the work and solving real world problems that face today's energy system.

Years later, this interest has blown into a storied career. I am a corrosion expert that has been responsible for the assets at a premier O&G pipeline company to leading teams at an innovative corrosion inhibitor developer business.

My Style

I am problem solver by nature. I love working with diverse sets of people that have different experiences and backgrounds. Furthermore, I like to better those around me – I believe in giving back to my community and workplace.

Greatest Contribution

As a corrosion expert, I am proud that no internal corrosion related incidence has happened under my purview.

I have also made several contributions through NACE International including development of the first NACE Technical Report on corrosion inhibitor (31215) and NACE Publication on hydrogen monitors (1C184), co-development of the "TEG-097X Electrochemical techniques for corrosion monitoring" tutorial (a tutorial we started in 2002 and is still being continued!) and the Standard Practice on control of internal corrosion in pipelines (SP0106). And, of course, being the chair of the NACE Annual Conference Program Committee (ACPC).

Pinnacle Moment

I would consider my involvement with NACE International (now AMPP) as a career defining moment – I was able to meet like-minded peers and dream bigger. Receiving the NACE Technical Achievement award (2014) and being recognized by thought leaders and coworkers was my pinnacle moment.

Advice to Industry

Bring younger people into the industry. Encourage them, mentor them, and help them become the corrosion experts of tomorrow.