STEM-Corrosion™

Spring 2021, May Edition: Newsletter 08

What is Important: Speed or Direction?

"*The speed is immaterial, if your direction is wrong*", Mahatma Gandhi. Similarly, corrosion rate is immaterial if your corrosion mechanism is wrong!

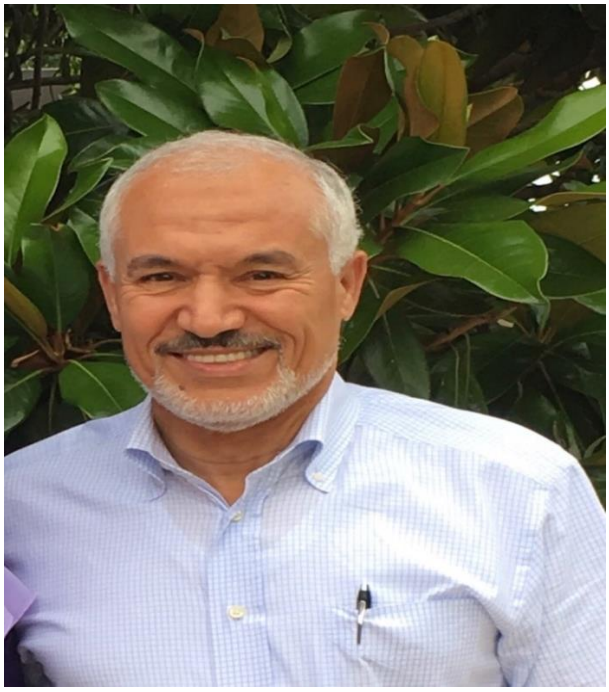
Using general corrosion rates from short-term laboratory tests to predict field localized corrosion rates is analogous to training with "domestic cat" to understand the behavior of "wild tiger". Well both domestic cat and tiger belong to "Felidae family" and the similarity ends there!

Internal corrosion may occur by at least 13 different mechanisms: localized pitting corrosion (LPC), microbiologically influenced corrosion (MIC), underdeposit corrosion (UDC), flow induced localized corrosion (FILC), erosion influenced corrosion (EIC), corrosion influenced erosion (CIE), erosion-corrosion (EC), top of the line corrosion (TLC), crevice corrosion (CC), weld-zone corrosion (WZC), galvanic corrosion (GLC), corrosion under insulation (CUI) or corrosion under coating (CUC), and general corrosion (GC). **iFILMS™** (for internal corrosion control) analyses and integrates all thirteen mechanisms and then predicts internal corrosion rates.

External corrosion may occur by at least 13 different mechanisms: shallow pitting corrosion (SPC), deep pitting corrosion (DPC), axial gauge or groove corrosion (AGC), narrow axial external corrosion (NAEC), weld zone corrosion (WZC), fatigue corrosion cracking (FCC), stress-corrosion cracking (near neutral SCC and high pH SCC), alternating current corrosion (ACC), erosion-corrosion (EC), abrasion corrosion (AC), telluric current corrosion (TCC), stray current corrosion (SC), and general corrosion (GC). **Expedition™** (for external corrosion control) analyses and integrates all thirteen mechanisms and then predicts external corrosion rates.

Top Influencer of This Newsletter:

Khlefa Esaklul



My Story

My story is that of someone who survived childhood poverty. I never dreamed of obtaining a higher education, let alone practicing a profession I didn't know existed at the time.

I came to the US on a scholarship and had to study in a language I had not mastered, one I had struggled with in High School, and worked hard to graduate with three degrees from the University of Minnesota. That is where I first learned about materials and failure analysis, which quickly became my passion and is the profession I was eager to work in. I learned early on that corrosion in all of its forms is central to the materials engineering profession.

In reflecting on the last 38 years (1984-2021) of my professional career, my passion for the profession remains strong and I continue to have a desire to learn. Although my career began in the academic world teaching in University of Tripoli Libya and establishing a department of Materials Science and engineering, my interest and excitement in seeing immediate results of my work ultimately brought me back to the US to work in the industry.

My industrial career began at a major failure analysis consultant company where I honed my skills in understanding how to conduct failure analysis for industrial and legal clients. Four years later, I was hired by Amoco to be a rotating equipment failure analyst. That did not last long. They recognized the knowledge and experience I had in oil and gas production, which I gained during my short academic tenure and during my consultancy with oil and gas companies and asked me to shift to corrosion and materials selection.

My Style

Corrosion, failure analysis, materials selection, and integrity management became the career path that gave me opportunities to work in research, operation, and projects with Amoco, BP (after the merger with Amoco), and now with Occidental Oil and Gas.

I consider myself very fortunate that my career path has covered oil and gas production, both onshore and offshore, including major deepwater projects from drilling to production, plants and pipelines, and has extended to refinery and chemicals. These opportunities took me all over the world and have allowed me to meet people, make friends, and experience many cultures, which has taught me a great deal.

My involvement with NACE since my college days, and with the Technical committees over the last 25 years, has been rewarding in building friendships, interacting with peers, and feeling that I have been a contributor in enhancing the field of corrosion control and in the role of NACE worldwide.

Greatest Contribution

Although my greatest contribution is left for others to judge, I hope what I will be remembered for is my commitment to the profession and for helping others build their careers in engineering, particularly in the field of corrosion and materials.

Advice to Industry

Invest in human capital!

People are the ones who will achieve the safety, environmental, and commercial success, and deliver the goals of the company. This can be achieved through:

1. Investment into the development of the new generation of professionals through training and active participation in technical societies/organizations. Demand it, don't just offer it. This is the best way to learn and build networks.
2. Be an open learning organization. Learn from failures and share your experience. Do not stifle learning.
3. Place value on research, particularly joint industry programs. There is high return on investment, both in the value of the work product and in contribution to the development of the future workforce.
4. Embrace corrosion mitigation and monitoring technologies and apply them! Don't wait for others to do it first.
5. Build the culture of your workplace so that your engineers look at their roles as professionals who are proud of their trade, not just as a salary producing job.