



## 2023 Edition: Newsletter 28

### Consistency Required in the Evaluation of Corrosion Inhibitors Used in the Oil and Gas Industry

Corrosion is effectively and economically controlled predominantly by four (4) control strategies. These time-tested and field proven strategies are selection, design, and use of appropriate materials, protective coatings, cathodic protection (CP), and corrosion inhibitors.

In the case of materials, coatings, and cathodic protection, quantitative evaluation criteria have been established and are, in many cases, adopted by regulatory authorities. In the case of corrosion inhibitors, there is no standard evaluation to determine when corrosion inhibitors are required or how well corrosion inhibitors should perform. Owing to an absence of consensus standards, most companies use in-house methods for evaluating, selecting, applying, or monitoring inhibitor performance.

Maturity of Select Corrosion Control Strategies

Evidence	Materials	Coatings	Cathodic Protection	Corrosion Inhibitors
Requirements cited in regulations and standards <sup>1</sup>	Yes	Yes	Yes	No
Examples of procedures or guidelines	AMPP MR0175 /ISO 15156	CSA Z240.20 CSA Z240.22 CSA Z240.30	AMPP SP 0169 CGA OCC 01	ASTM G202
Examples of training that is available	AMPP MR0175 /ISO 15156	AMPP Coating Applicator/Inspector Certification Programs	AMPP CP Certification Program	ASTM Corrosion Inhibitors Course
Evaluation strategy	Quantitative	Quantitative	Quantitative	Qualitative

<sup>1</sup> Materials, coatings, and CP requirements are extensively cited in Canadian and US pipeline regulations (CSA Z662 (Canada) and the Code of Federal Regulations (US)). AMPP (formerly NACE) offers a plethora of consensus standards, procedures, and training courses. In addition to these three corrosion control requirements being prescriptive – the evaluation of these strategies have quantitative requirements.

While there is generalized agreement that true consensus standards would be beneficial, there has not been enough coordinated effort to advance technology in this area. General obstacles to the development of true consensus standards on corrosion inhibitors include:

- Lack of agreement on what parameters to evaluate/test/monitor (i.e., which environmental conditions are most important to emulate).
- Cost/effort avoidance – laboratory testing can be expensive.

To fix this issue and to understand the status of corrosion inhibitor evaluation, a Joint Industry Project (JIP) was initiated with 12 sponsors.

Phase 1, carried out in 2023, involved collection of existing company practices from owners, operators, chemical developer/suppliers, and subject matter experts (SME). Two hundred and twenty-six (226) interviews have been completed. Over seventy-five (75) professionals from Canada, India, Ecuador, Kuwait, Malaysia, Saudi Arabia, Singapore, UAE, and USA participated in the interviews. These interviews covered twenty-three (23) applications from well to wheel in which corrosion inhibitors are being used or considered in the oil and gas industry. Over one hundred and ten (110) attributes of corrosion inhibitors were collected under ten (10) categories from each of the interviewees.

Phase 1 report<sup>2</sup> - synthesizing the findings from the interviews, gaps in the industry, opportunities for improvements, and critical next steps - was used as the basis for Phase 2 of JIP.

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<sup>2</sup>Collection and Analysis of Data and Experience from Companies, Report: **2019-10-01-V.01**