Preparation, Installation, Analysis, and Interpretation of Corrosion Coupons in Hydrocarbon Operations

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Foreword

This standard practice was prepared to encourage the use of uniform and industry-proven methods to monitor mass-loss and pitting corrosion in hydrocarbon operations.

Scope

This standard outlines procedures for preparing, installing, and analyzing metallic corrosion coupons. Factors considered in the interpretation of results obtained from these corrosion coupons are also included for the use of oil, gas and service industry personnel.

Rationale

In this revision, many lengthy paragraphs were modified technically, grammatically, broken into new paragraphs (with or without additional information) for better clarity, understanding and ease of reading (modifications included tables, equations and Appendix A [nonmandatory]). The major change to the standard is removal of the "Severe" category from the Qualitative Categorization of Carbon Steel Corrosion & Pitting Rates (Table 2), as "High" itself provides the undergoing corrosion risk for process streams.

Additionally, emphasis on photography of corrosion coupons is highlighted in this revision with the inclusion of new Appendix B (nonmandatory), showing coupons before/after cleaning, corrosion morphology, relevant data, findings and conclusion; to provide supplementary information and guidance for the user of this standard. Also, this revision highlights the importance of accessibility for servicing/retrieval of corrosion coupons or probes data collection and included access platform example photographs.

In AMPP standards, the terms *shall* and *must* are used to state requirements and are considered mandatory. The term *should* is used to state something that is recommended, but is not considered mandatory. The term *may* is used to state something considered optional.

Section 1: General

1.1 This standard is presented for the use of metallic corrosion coupons in hydrocarbon production and processing facilities, including but not limited to drilling, production, and transportation operations on land, onshore and offshore. Hydrocarbon operations handle fluids including but not limited to oil, water, gas, condensate, and drilling fluids.

1.2 This standard may be referenced by other industries that may process or handle corrosive fluids. However, subject matter experts familiar with corrosion mechanisms and corrosion monitoring in those industries shall be consulted for applicability, utilization and implementation of the recommendations of this standard.

1.3 When used in this standard, system denotes a functional unit including but not limited to: a producing well; flowline and tank battery; water, oil, or gas collection facility; water or gas injection facility; or a gas dehydration or sweetening unit.

1.4 Corrosion coupon testing consists of the exposure of a small specimen of metal (the coupon) to an environment of interest for a measured period of time to determine the reaction of the metal to the environment. Corrosion coupons are used to evaluate the corrosivity of various systems, to monitor the effectiveness of corrosion-mitigation programs, and to evaluate the suitability of different metals for specific systems and environments.

1.5 Coupons shall be installed in the system and exposed to the corrosive fluid in a manner that is as representative as possible; such that corrosion on the coupon may be considered indicative of corrosion within the system as a whole. Providing that coupons are exposed in the manner indicated, they may be inserted directly into a system or into a take-off or side stream from the main system.

1.6 General corrosion/pitting rates shown by coupons and most other corrosion-monitoring devices seldom duplicate the actual rates on the system piping, pipelines and vessels. Potentially more accurate system general