Title: Enhancing Corrosion Protection in Aboveground Storage Tanks with Vapor Phase Corrosion Inhibitors

Abstract:
Underside corrosion of aboveground storage tank (AST) bottom plates remains a critical integrity concern, particularly in cases where cathodic protection (CP) performance is compromised due to poor electrical continuity with the sand foundation or shielding by contaminants such as oily sand or bitumen. While CP and protective coatings are widely applied, their limitations in certain field conditions necessitate supplemental mitigation approaches. Vapor phase corrosion inhibitors (VpCI) have gained increasing attention as a viable solution, especially for complex tank bottom environments.

Recent industry standards, including API TR 655 and AMPP SP21474-2023, offer comprehensive guidance on the design, application, and performance validation of VpCI systems. These inhibitors can be deployed across various tank configurations using application-specific methods such as:

1) Slurry injection through under-tank dispensing systems during new construction,
2) Powder injection beneath existing tanks, and
3) Emitter placement around the tank perimeter for retrofitting scenarios.

Each method can serve as a standalone corrosion control strategy or complement existing CP and coating systems for enhanced protection.

Field implementations have demonstrated a minimum 70% reduction in underside corrosion rates, often achieving corrosion rates below 5 mils per year (MPY). These results support the effectiveness of VpCI in extending AST service life, reducing the frequency of internal inspections, and improving overall risk management. This paper will discuss corrosion mechanisms, design considerations, and performance outcomes associated with VpCI implementation in AST bottom protection.

Author:

Name:	Vimonrat Samorna
Organization:	J.S.T. Services Company Limited
Job Title:	Corrosion Engineering Manager, Corrosion Engineering Section, Corrosion Control Division
Qualifications:	B.Eng Metallurgical Engineering
Professional:	AMPP Senior Corrosion Technologist AMPP Internal Corrosion Technologist

Co-Author:

Name:	Trevor Goss
Organization:	J.S.T. Services Company Limited
Job Title:	Manager, Corrosion Control Division
Qualification:	B.Eng (Hons) Mechanical Engineering
Professional:	Fellow of the Institute of Corrosion (FICorr) AMPP Corrosion Specialist AMPP Cathodic Protection Specialist

Keyword: Above Ground Storage Tank, Cathodic Protection, Vapor Phase Corrosion Inhibitor