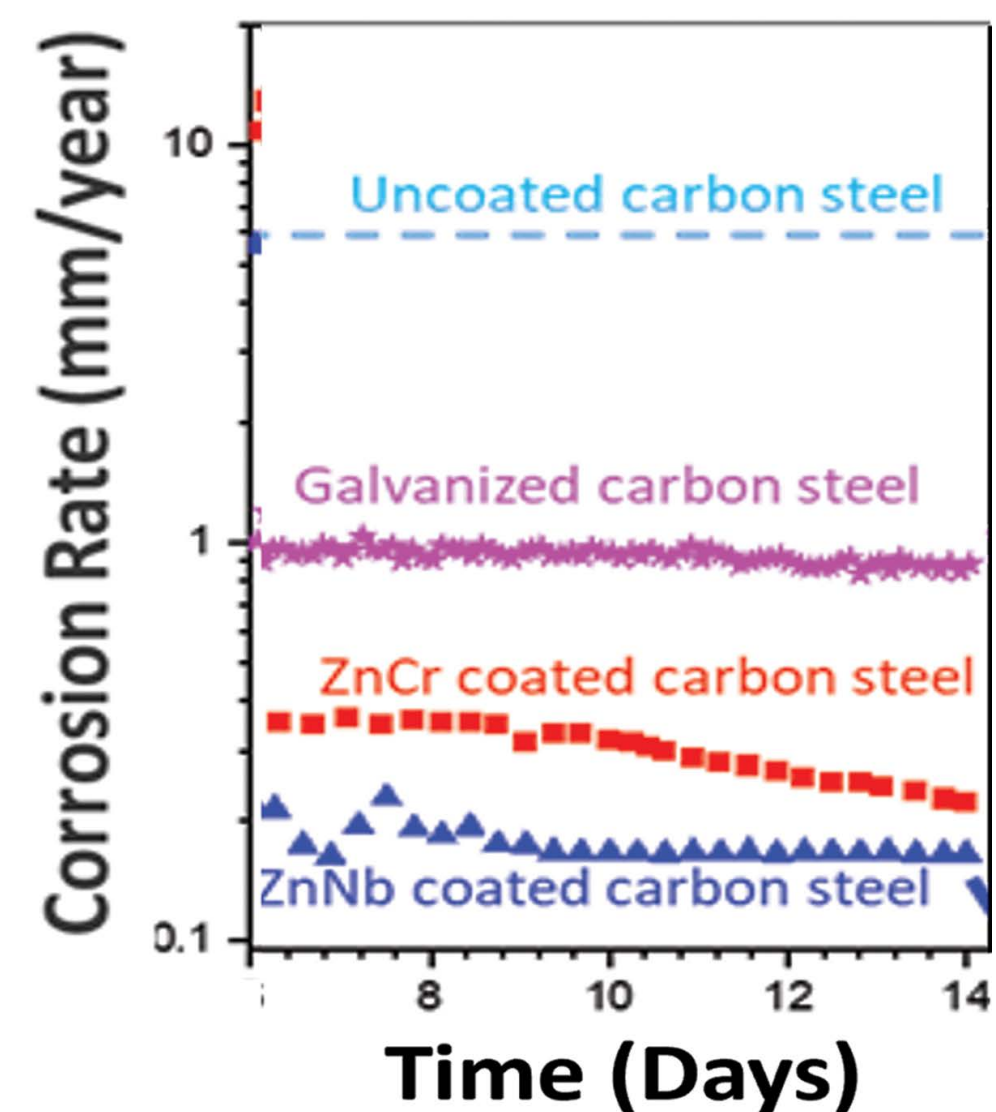
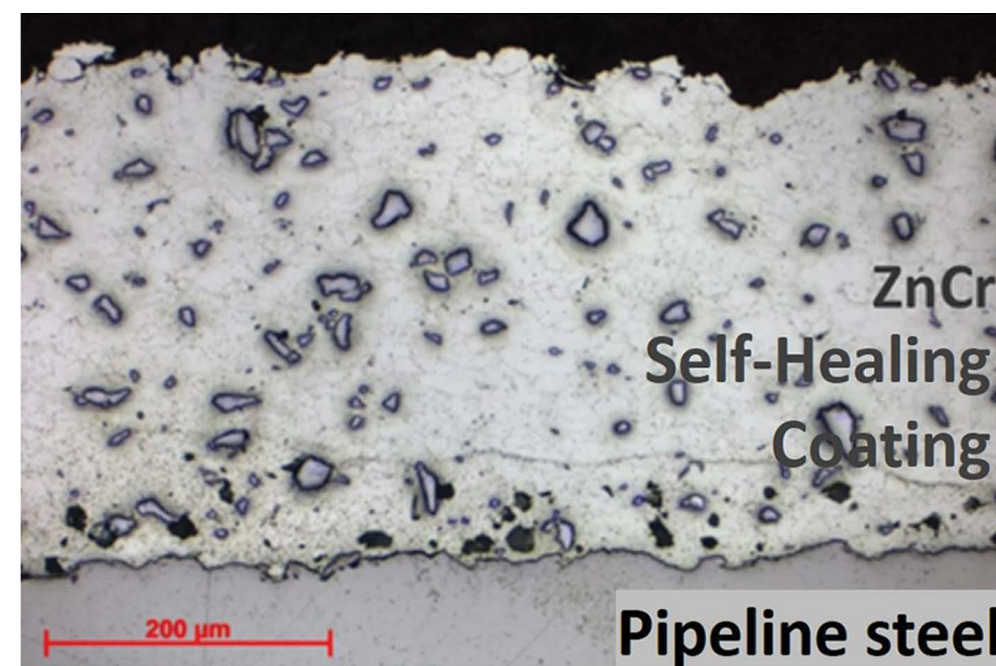


# Enhancing Pipeline Safety and Reliability

*Innovative self-healing coating technology for safeguarding natural gas, hydrogen, and CO<sub>2</sub> pipelines from corrosion, bolstering reliability and averting catastrophic failures.*



Field testing of a pipe with self-healing coating on interior surface at a NW Natural Gas Company site.

Corrosion is a leading cause of failures in pipelines. Data from the Pipeline and Hazardous Materials Safety Administration shows that 12% of natural gas pipeline incidents are caused by internal corrosion and can result in leakage, cracks, and rupture of the pipeline, leading to explosion hazards and methane emissions. NETL has developed a new zinc-rich material that creates an effective protective layer for internal pipeline corrosion protection.

- Applied by cold spray to coat the interior of pipelines.
- Can be used to repair used/damaged pipelines or for repurposing.
- Remains stable regardless of temperature/pressure changes of the service environment.
- Can be used in CO<sub>2</sub> and H<sub>2</sub> pipelines and is an H<sub>2</sub> barrier protecting steel pipelines from H<sub>2</sub> embrittlement.
- Is self-healing when damaged by forming protective corrosion products over the damaged part.
- Field Assessment: A three-foot-long section of pipe coated internally with NETL's self-healing coating was exposed to high-pressure wet natural gas withdrawn from NW Natural Gas Company's storage field in Oregon for 131 days. Protective corrosion products forming on the coating prevented further corrosion and successfully protected steel pipeline.

DOE PROGRAM

**Methane Mitigation Technologies**

NETL PARTNERS

