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Exam : **AMPP-CP2**

Title : Cathodic Protection Technician (NACE-CP2-001)

Version : DEMO

1.A technician is investigating corrosion on a buried steel pipeline. The inspection report shows that one area of the pipeline has experienced metal loss while another area remains intact.
Which electrochemical process is occurring at the area experiencing metal loss?
A. Reduction at the cathode
B. Oxidation at the anode
C. Electron consumption at the electrolyte
D. Polarization caused by protective current
Answer: B
Explanation:
Metal loss occurs at the anodic area where oxidation takes place. During oxidation, iron atoms lose electrons and enter the electrolyte as metal ions.
The cathodic area consumes electrons through reduction reactions and normally does not experience metal loss.
Polarization occurs when current changes the electrode potential, such as during cathodic protection, but it is not the cause of natural anodic metal dissolution.

2.A corrosion engineer explains that corrosion cannot continue unless electrons can move from one area of a metallic structure to another.
Which component of the corrosion cell provides this electron path?
A. Electrolyte
B. Metallic connection
C. Reference electrode
D. Protective coating
Answer: B
Explanation:
Electrons move through the metallic path connecting anodic and cathodic areas.
The electrolyte provides ionic movement, not electron movement. A reference electrode is used for potential measurements, and coatings are used to reduce exposure of the metal surface.

3.A buried pipeline has a small coating defect exposing bare steel.
Compared with a pipeline section with intact coating, why does this location usually require additional cathodic protection current?
A. The coating defect creates additional exposed steel surface requiring protection
B. The coating defect prevents current from reaching the pipeline
C. The coating defect eliminates the corrosion cell
D. The coating defect changes the steel into a permanent cathode
Answer: A
Explanation:
Coating defects expose bare steel to the electrolyte. These exposed areas increase the surface area that must be polarized by cathodic protection current.
A coating defect does not eliminate corrosion or automatically make the steel a cathode. Instead, it increases CP current demand.

4.A steel pipeline is electrically connected to a magnesium anode and both are buried in the same soil

environment.
What is the expected behavior of the magnesium anode?
A. It becomes the cathode and is protected from corrosion
B. It becomes the anode and provides protective current
C. It stops participating in electrochemical reactions
D. It increases the corrosion rate of the steel pipeline
Answer: B
Explanation:
Magnesium is more active than steel. When electrically connected in the same electrolyte, magnesium becomes the anode and sacrifices itself by providing protective current to the steel structure.
This is the operating principle of a galvanic anode cathodic protection system.

5.Which statement BEST describes polarization in a cathodic protection system?
A. The permanent removal of all corrosion reactions
B. The shift in electrode potential caused by applied current
C. The physical removal of corrosion products
D. The loss of electrical continuity in the pipeline
Answer: B
Explanation:
Polarization is the change in electrode potential caused by current flow.
In cathodic protection, applied current shifts the protected structure potential in the negative direction.
Polarization measurements are important when evaluating CP effectiveness.