

Compiled by Amy McIntosh



Leak Prevention

Protecting pipeline to secure water supply

Corroded pipeline leads to an estimated 1.7 trillion gal of water leaks per year. *WWD* Assistant Editor Amy McIntosh spoke with Richard Grant, principal at Russell Corrosion Consultants, about the origin of corrosion and the importance of treatment.

Amy McIntosh: How does corrosion originate in a water pipeline?

Richard Grant: Corrosion is a naturally occurring electrochemical process in nature. Corrosion is nature's method whereby metals and alloys return to their unrefined, naturally occurring forms as elements and minerals. When ore is refined, this natural and most stable state is reversed to produce the actual metal, which is less stable under natural conditions than the base element. A large amount of energy is applied to the base metal as the metal is converted from its oxide, carbonate, sulfide, etc. Given the right conditions, these high-energy and more ordered metals tend to revert to their low-energy state and less ordered elemental condition.

Thus, with most metals, including iron and steel alloys, this means that, under most natural conditions, unless special precautions are followed, metals will combine with oxygen to form rust and corrosion.

Virtually all forms of corrosion occur by the same basic electrochemical reaction as oxidation. As the name of the reaction implies, the presence of oxygen or oxidizers is not only required for the reaction to begin, but to continue. Essentially, the metal combines with oxygen to form an oxide substance, which manifests itself as rust or corrosion.

McIntosh: Once corrosion exists, how can it be treated?

Grant: The most important fact is that this electrochemical process can be stopped or slowed to a manageable rate through the application of various corrosion prevention measures. Treatment methods for corrosion of pipeline can include protective coatings or cathodic protection.

Protective coatings can be utilized effectively as the "first line of defense" for pipeline protection. Extruded polyethylene, fusion-bonded epoxy and polyurethane coatings can all be utilized in different applications on

different substrates. These coatings work by dielectrically isolating the pipe from its surrounding environment and thus preventing the oxygen and other components necessary for the corrosion process to propagate.

There are several ways to deter the corrosion of iron, one of which is cathodic protection. This method is used on submerged marine structures, water storage tanks, underground gas pipe, oil platform supports and other structures exposed to corrosive surroundings. Cathodic protection works by eliminating anodic (corroding) areas and rendering the structure to be protected a complete cathode. This works by utilizing an external anode, which flows current through the soil onto the pipe surface. Anodes consume themselves over time and must be replaced periodically.

McIntosh: What are the short- and long-term effects of corrosion in water pipeline?

Grant: Our nation's water and wastewater infrastructure is already in a deteriorated state. Corrosion is literally eating away at our nation's water and wastewater pipeline every day. The short-term effects are more pipeline failures, loss of revenue for the water utilities, loss of service for the consumer and potential hazards when lines fail (flooding, discharge of unsafe water into environmentally protected areas, loss of homes, etc.). In addition, the cost to replace this infrastructure is enormous and growing by the year.

Longer term—unless we begin to take a proactive stance on protecting our water and wastewater assets—there is a replacement budget that we will not be able to pay for and a loss of precious water that we cannot replace. Utilities and owners must remain diligent in dedicating their budgets toward corrosion prevention, as time is not on our side. *WWD*

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News Briefs compiled by Amy McIntosh

Senate Introduces Water Infrastructure Legislation

The U.S. Senate introduced S. 335, the Water Infrastructure Finance and Innovation Act of 2013, which would provide low-interest loans for the construction of infrastructure in local communities.

Aquatech India to Include Tradeshow, Conference

The fourth edition of Aquatech India will be held April 8 to 10 at the India Expo Centre and Mart in Delhi. The event also will include a three-day conference, titled "Public Water Utility in 2020."

California WEA Panel to be Held in April

The California Water Environment Assn.'s Cutting Edge Technology Committee will hold a panel discussion in the Palm Springs Convention Center on April 18, which will focus on the "flushables" issue in modern trash/wastewater.

State of the Union Focuses on Economic Recovery, Climate Change

In his February State of the Union address, President Obama focused on the role of infrastructure to a healthy economy and identified climate change and resilience as national priorities.

Urban Water Sustainability Conference Set for Fall

The fourth annual Urban Water Sustainability Leadership Conference will be held Sept. 23 to 26 in Los Angeles. Organized by the U.S. Water Alliance's Urban Water Sustainability Council, the event will be focused on answering leadership questions.

Clean Water Groups Shape 'Utility of the Future'

The National Assn. of Clean Water Agencies, the Water Environment Research Foundation and the Water Environment Federation jointly released a document, "Water Resources Utility of the Future ...

Blueprint for Action," that defines the evolving environmental, economic and social roles that clean water utilities are playing in their communities.

Water Delegation to Connect Professionals

The National Ground Water Assn. and the People to People Citizen Ambassador Program are coordinating a delegation of water resource professionals who will travel to Delhi, Jaipur and Agra, India, Sept. 22 to 30. The delegation will increase collaboration with Indian professionals and organizations on topics of mutual interest in the water resources arena.

U.S. Water Utilities Embark on Improvement Projects

The need to meet new environmental standards, the growing demand for water and the need to replace obsolete infrastructure are causing U.S. water utilities to embark on thousands of capital improvement projects. These projects are tracked in the McIlvaine "North American Public Water Plants and People" report.

NanoH2O Chosen for Israel Desalination Plant

NanoH2O Inc. has been selected by Via Maris Desalination Ltd. to provide high-rejection membranes for the expansion of the Palmachim desalination plant in Israel. The membranes will produce 110,000 cu meters of desalinated water per day.

Australia's Largest Desalination Plant Reaches Full Operation

The Victorian Desalination Project, located south-east of Melbourne, Australia, has reached full operation. GE supplied technology that provides a rainfall-independent water supply to complement catchments and storages in the Melbourne area.

Industry News

- Steven D. Winchester was named CEO of MaxWest Environmental Systems.
- Ian Fox joined Seven Seas Water Corp. as senior vice president, international business development.
- WesTech Eng. Inc. appointed Les Uhlmeier as the leader of its Municipal Water Treatment Business Unit, overseeing the Microfloc and General Filter product lines. *WWD*