

Technique developed to combat CUI

A Scotland-based consulting firm has developed a preservation maintenance program to inhibit corrosion under insulation (CUI), which is considered one of the most costly, invasive, and potentially damaging types of corrosion in process plants both onshore and offshore.

"Insulation materials themselves generally are noncorrosive," says Allan Durham, Managing Director of Corrosion Solutions, Ltd. (Aberdeen, U.K.). "It is also a well-known fact that insulation is very rarely sealed thoroughly, which allows water and contaminants to seep into and below the insulation—accelerating the corrosion process." He explains that if insulation is installed wet or becomes wet through defects in top covers, then pipe coatings will inevitably rapidly deteriorate and pipe walls will corrode. "This corrosion problem is further complicated by the fact that it is covered and only visible by either removing insulation or by various nondestructive testing [NDT] techniques," Durham adds. Testing techniques requiring insulation removal include profile radiography and ultrasonics. Other noninvasive NDT methods include real-time radiography and pulsed eddy current.

Durham says that his company's process involves periodically injecting a vapor-phase corrosion inhibitor through small holes made in the outer covering of the insulation; the holes subsequently are re-sealed. "The corrosion inhibitor is applied at between 1- and 3-m intervals, depending on the pipe diameter," he explains, adding that the inhibitor is manufactured by Cortec Corp. (St. Paul, Minnesota). "The inhibitor is then drawn through a capillary action to distribute the inhibitor before the vapor phase function is chemically adsorbed into the steel surface, leaving a molecular film which will protect both bare steel and find its way through damaged coatings. This system will also enhance the life expectancy of a coating currently in place."

According to Durham, protection periods between applications of inhibitor range from 6 to 18 months depending on various site-specific conditions as well as



the state of the insulation. "The condition of the insulation and top cover conditions are the key points to determine how long the inhibitor will last," he says, adding that inhibitor can be applied either manually or with an automatic injection system.

"This is another valuable tool for maintenance personnel to have available," concludes Durham. "Vapor phase corrosion inhibitors are perfect for this type of application. This is an economical, safe, and environmentally sound method of corrosion protection in a difficult-to-protect area."

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