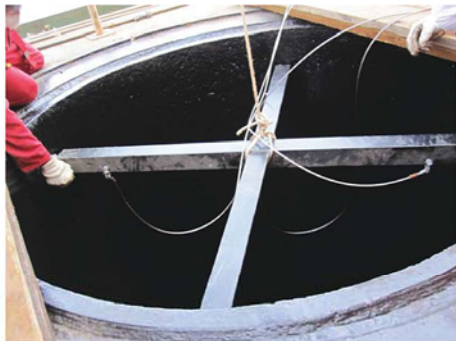


Caisson Legs on Offshore Platform Protected with a Vapor Corrosion Inhibitor



Steel frame setup for suspending VCI pouches.

In the offshore Umm Shaif and Zakum oil and gas fields near Abu Dhabi in the United Arab Emirates, multiple barge-type offshore platforms are constructed and operated on caisson legs.

The uncoated interiors of the caisson legs on a particular platform contained blasting grit, biocide-treated water, and suspended sacrificial anodes. After two decades of operation, a build-up of hydrogen gas generated by the depleted anodes inside a caisson leg led to an explosion. Recommendations of the ensuing investigation included removal of the anodes, biocide-treated water, and accumulated blasting grit.

A pilot study, discussed in CORROSION 2014 paper no. 4200, "Protection of Offshore Platform Caisson Legs with a Vapor Corrosion Inhibitor—A Case Study," by T.A. Rahman Al-Sayed, A.F. Eid, M.M. Al-Marzooqi, and U. Jacir, was then conducted to evaluate the use of vapor corrosion inhibitors (VCIs) to protect the integrity of the structure. Treatment started by spraying the internal diameter of the leg with a water-based solution containing a VCI with a biocide treatment. This was followed by fogging the internal space with an amine carboxylate VCI. Finally, a string of pouches containing VCI powder was suspended on hangers to assure continuous saturation of inhibitor in the space. Corrosion coupons were installed 6 m below the manhole before closing it. The corrosion coupons were retrieved and evaluated at different time intervals.

After one year and beyond, results were positive and the corrosion protection system was adopted for rectification of the problem. Results showed clear improvement in the VCI-treated caisson leg where acceptable low corrosion rates were maintained.