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OIL & REFINED PRODUCTS

COMPOSITE REPAIR &
COATINGS SHOWCASE



COATINGS

ABRASION RESISTANT COATING FOR STEEL TANK



FULLY INSTALLED IN A SINGLE DAY IN HIGH HUMIDITY

A carbon steel tank was removed from a drilling rig and sent out for refurbishment. The tank was experiencing internal corrosion/erosion especially in the bottom of the tank. There was also a through-wall failure on the side where

a support was removed. The small, through-wall failure was repaired using Ceramic Repair Putty, then HP-400 Novo was applied with an airless sprayer at 25 - 30 mils DFT. The system was fully installed in a single day, in greater than 95% humidity, without any issues.

HP-400 Novo, Ceramic Repair Putty

01

COATINGS

SECONDARY CONTAINMENT FOR FILL STATION



PROTECTION FROM ACIDIC FRACKING FLUIDS

An energy services provider was looking to protect its secondary containment system at its fracking fluid fill station. In order to ensure the tank farm and fill area did not have concrete damage when the acidic fluids spilled, they

installed a chemical-resistant coating. The secondary containment area also included a non-skid area to protect worker safety.

FRP Saturant 200, HP-410 GF

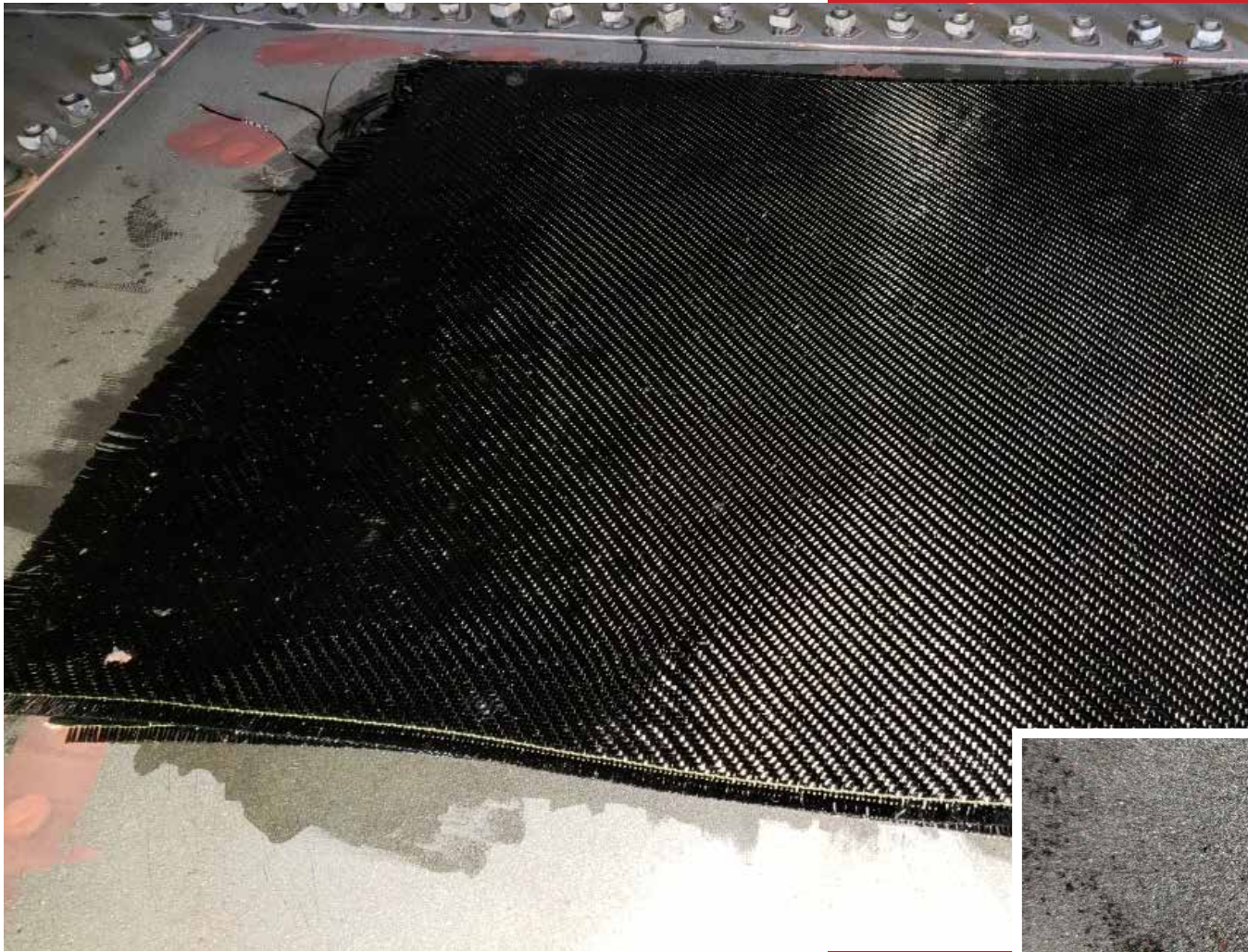
02



COMPOSITE TANK REPAIR

BOLTED OILY WATER TANK CORROSION REPAIR

CF-500 BD, FRP 210 HT, FRP 230-PC, HP-410 GF



03

Carbon Fiber Patch Repair

EFFECTIVE SOLUTION TO OILY WATER CHALLENGES

A company in the oil and gas industry specializing in wellsite wastewater removal and processing was experiencing through-wall failures and leaks of oily water in one of their storage tanks. The tank was approximately 40 ft. in diameter and featured a bolted, rolled, tapered plate design. The company reached out to Advanced FRP's team of experts to help them determine what was causing the through-wall failures and resultant leaks. The company wondered if Advanced FRP could offer a repair solution that would stop the leaks, prevent further corrosion, and preserve their storage tank.



ADVANCED FRP DESIGNED A REPAIR SOLUTION TO:

- Include a decontamination step to kill any microbes on the surface to address the treatment of MIC.
- Repair exposed through-wall failures with carbon fiber composite patches.
- Fully encapsulate the bolts on the tank floor with immersion-grade epoxy.
- Prevent further corrosion with a MIC-resistant novolac epoxy coating system over the entire tank surface.

COMPOSITE PIPE REPAIR

CORROSION ON REFINED PRODUCT PIPELINE



CORROSION PROTECTION & REINFORCEMENT

A major refined products pipeline company discovered severe corrosion on a section of transfer pipe at one of their terminal facilities. The corrosion was primarily located at the ground-to-air

interface where the pipe comes out of the ground. The pipe was repaired with four layers of high-strength carbon fiber to provide structural reinforcement, as well as a corrosion barrier.

CF-500 BD, FRP 200 Saturant

COMPOSITE PIPE REPAIR

CORROSION REPAIR FOR UNDERGROUND PIPELINE



RESPONSE TO SMART PIGGING ASSESSMENT

A standard smart pigging corrosion assessment found areas that required mitigation on a pipeline buried 10 feet below grade. The operator wanted a long-term maintenance free solution that was reliable enough to prevent

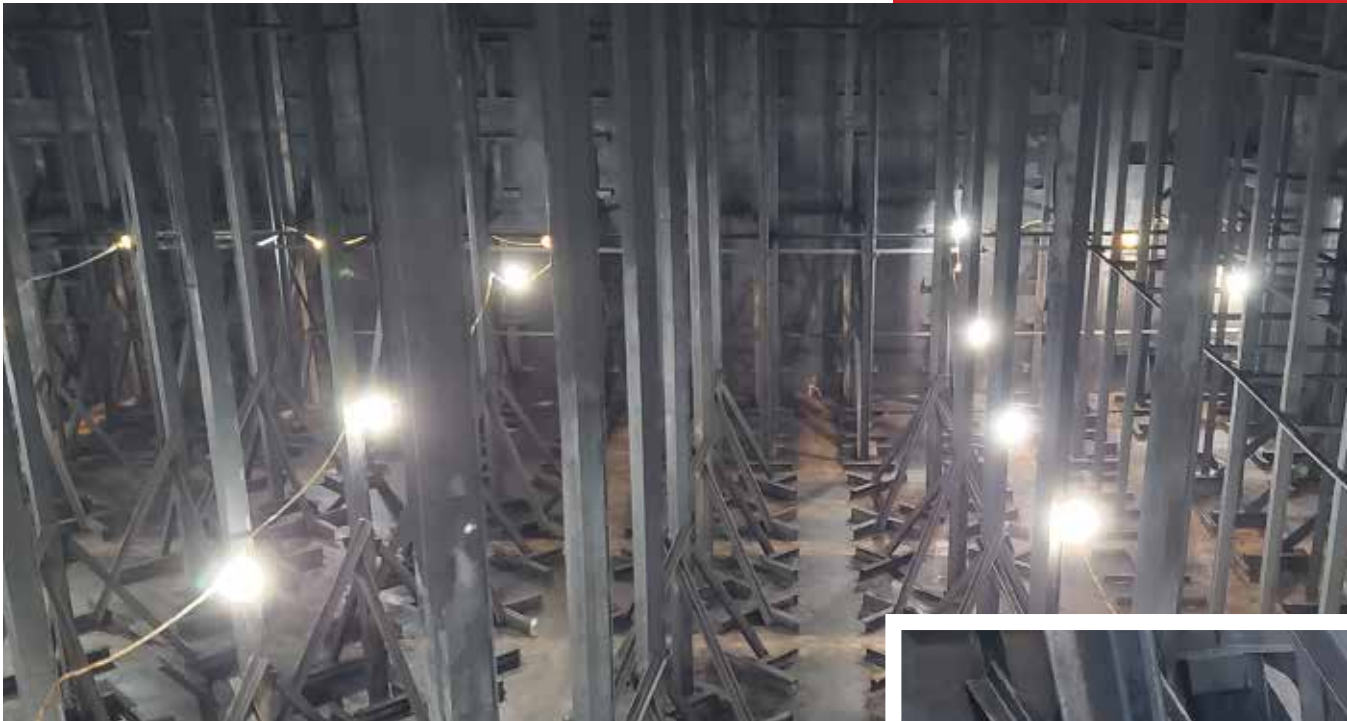
any of the flammable material within to leak into the environment. Advanced FRP Systems developed a 4-layered carbon fiber reinforcement system that would eliminate corrosion and provide structural reinforcement to this critical asset.

CF-500 BD, FRP 200 Saturant

COATINGS

CLEANING & COATING FOR BIODIESEL TANK

FRP 201 OT Primer - HP 300 GF



IMPACT OF OIL ON THE SUBSTRATE PRIOR TO COATING

Traditional barrier coatings like an epoxy, polyurethane or vinyl ester do not stick well to an oil contaminated surface. Residual oil on a surface causes most liquids to bead up instead of wetting out the surface. Liquid applied coatings rely on physical adhesion to a rough substrate, which is why grit blasting is so critical. Oil contamination prevents the coating from wetting out the surface and filling in the profile created during grit blasting. This greatly reduces the adhesion of the coating. Very thick oils are even worse as they create a physical barrier layer between the coating and the substrate completely eliminating any adhesion of the coating. Coating systems that are applied without the proper adhesion values are prone to premature failure caused by the standard operating conditions for tanks, pipes and vessels.



06

Oil Tolerant Coating

SOLVENT AND HYDROCARBON IMMERSION

A New York based utility company had a large tank that previously held #6 Fuel oil. They planned to convert the 195 ft by 145 ft tank to a more environmentally friendly fuel. However, due to the complex geometry and abundance of high viscosity fuel oil, they found the tank to be extremely difficult to clean. After several attempts to clean the tank, the contractor spoke with Advanced FRP about an oil tolerant coating system. The oil tolerant system allowed for >2,000 psi adhesion despite oil being present on the floor in small quantities.



RIGOROUS CLEANING AND INSPECTION

A rigorous cleaning and inspection plan was implemented, and the tank was divided into nine sections. After cleaning, each section was grit blasted, coated with FRP 201 OT Primer, and followed by a 30 mils immersion-grade epoxy coating, HP 300 GF. The project faced some challenges with pinholes and thin spots due to the tank's complex geometry, but the contractor resolved the issues and completed the project, providing the end-user with confidence in the long-term corrosion protection of the tank.



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