

# Weight savings continues offshore Azerbaijan

## Various composite products save 214 tonnes on Azeri Central East

### Background

The bp-operated Azeri Central East (ACE) project is the latest development of the Azeri-Chirag-Deepwater Gunashli oilfield in the Azerbaijan sector of the Caspian Sea. The \$6-billion ACE project features a new 48-slot production, drilling, and quarters (PDQ) platform in a water depth of about 140 m.

BP—a repeat customer—and NOV Rig Technologies—the topsides drilling facility EPC contractor—selected Fiber Glass Systems to reduce the weight of both the modular drilling support module (MDSM) and drilling equipment set (DES) to assist with installation.

### Solution

Our team of experts designed and engineered a wide variety of Bondstrand™ fiber-reinforced polymer (FRP) composite structural products and glass-reinforced epoxy (GRE) piping systems, including many bespoke solutions. All the lightweight and corrosion-resistant products for the two drilling modules were manufactured at our Plymouth, UK facilities and shipped to the Bayil fabrication yard near Baku, Azerbaijan, for installation.

We supplied more than 700 m of fire integrity type approved MARRS™ (Multi-Angle Rapid Railing System) offshore handrails with FRP ladders, safety cages and gates, stairs, and jacket grating in the wave zone. This is the first installation of MARRS offshore handrails in the Caspian Sea on a jacket and topside.

We also provided more than 7.5 km of GRE piping in 7000M and 2420C series in sizes from 1 to 20 in. diameter for the sodium hypochlorite solution, open hazardous drains, sanitary drains, atmospheric vents, cooling water, fire-fighting water, portable water, and seawater.

Our design and engineering experts provided several bespoke solutions. For instance, we designed and built a platform to support the 30-tonne drag chain, which enabled the 2,350-tonne MDSM to move. We designed and engineered a fiberglass cantilever platform extension and supplied mud gutters for the first time. The FRP gutters on FRP structures had stainless steel liners to protect them from abrasive cuttings and mud. We also provided FRP wind walls, some of which had laminated joints to the steel structure to achieve an airtight connection.

Our team also worked with KBR to provide 45 m of bespoke wave zone handrails, 374 wave zone guard wire posts, and heavy-duty wave zone grating. One of our engineers spent several months at the KBR offices conducting stress analysis of the GRE pipework.

### Results

Using our FRP composite structures, GRE piping systems, and advanced engineering services, 214 tonnes of weight were saved compared with traditional metallic materials. Our GRE piping saved 146 tonnes compared with carbon steel, a weight saving of just below 80%, and the FRP structures saved 68 tonnes. These lightweight, durable, and corrosion-resistant products are easier to install, require minimal maintenance, reduce the total cost of ownership, and enhance safety and equipment performance.

In addition to weight savings, our composite products reduce carbon emissions and minimize environmental impact because they require less energy to manufacture, transport, and install and use less energy throughout their long service lives in corrosive offshore environments. In the harshest environments, these products reduce the embodied carbon of the project by up to 96% over a 20-year period.

### Case study facts

**Location:** Caspian Sea

**Customer:** BP Exploration (Caspian Sea) Limited

**Time frame:** 2019–2023

### Products

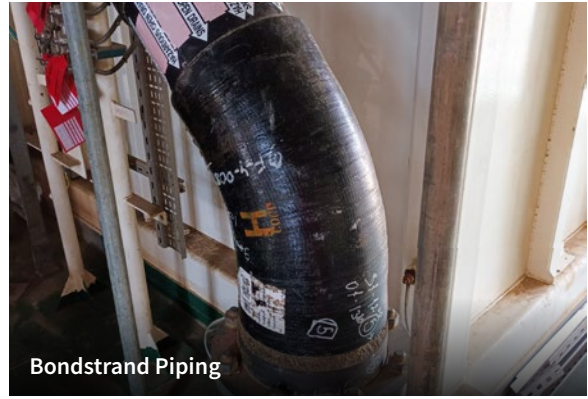
- More than 700 m of MARRS™ phenolic FRP offshore handrails
- More than 647 m<sup>2</sup> of Duragrid™ phenolic FRP grating
- More than 7.5 km of GRE piping
- Structural FRP drag chain support structure
- Wave zone FRP handrails, guard wire posts, and grating
- FRP ladders with safety cages where necessary, access platforms, and stairs
- FRP safety gates
- FRP Wind walls
- FRP Pipe sleeves
- FRP Luminaire brackets
- FRP Mud gutters



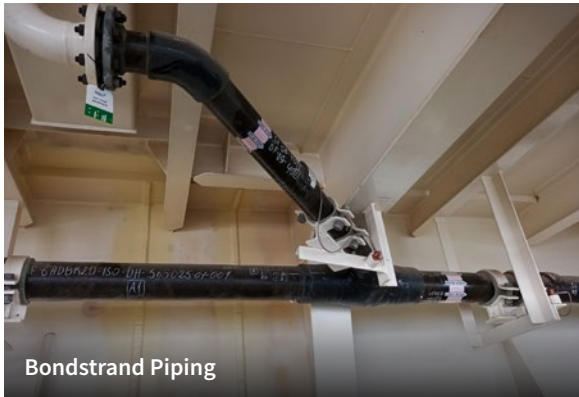
# Product examples



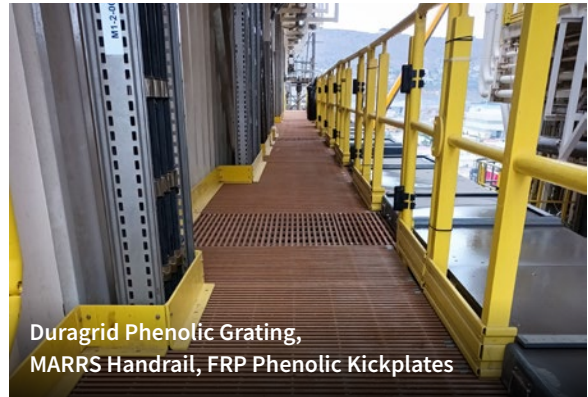
FRP Wind Walls



Bondstrand Piping



Bondstrand Piping



Duragrid Phenolic Grating,  
MARRS Handrail, FRP Phenolic Kickplates



FRP Access Structures



FRP Access Structures



FRP Drag Chain Support



FRP Mud Return Trough