



Fluid Transfer Solutions
Ship to Shore

Typical system layout



The type of solution and packages we offer vary according to the location and requirements. The illustration above depicts a typical ship to shore solution. The layflat hose has been deployed from a land based reeler system and pulled out to the ship using a small zephyr or similar vessel.

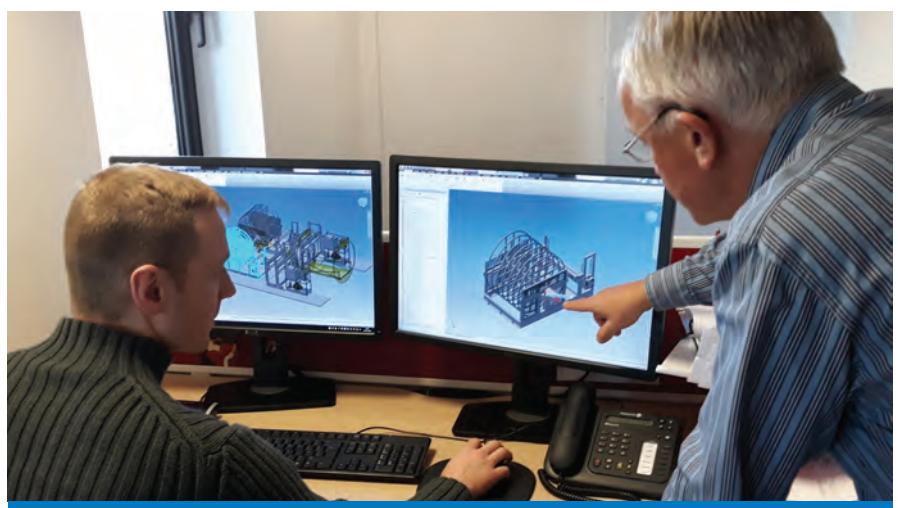
In this example it is connected to the pumping manifold and transfer of fuel is undertaken. The ability to run 200m lengths of hose minimises the number of joints required. Pigging equipment is available to purge the line once the transfer is complete.

Compared with a hard hose solution the scale of the equipment, speed of deployment and flexibility of the system elements is significantly more versatile, resulting in substantial cost savings.

Designing a solution

Working with our clients we assess each project, analyse flow rates, fuel types, distance and pressure to calculate the most efficient hose construction and diameter for each application.

Taking account of both shipboard and landside requirements we design a unique, full equipment, package solution for each project. In many cases, in addition to the hose assemblies, this will include hose deployment and retrieval systems, specialist dry break and breakaway couplings, hose pigging equipment and floatation accessories.



Supplying fluids to remote locations

In remote islands and shores where no suitable infrastructure is in place, the commercial transfer of fuel and water from ship-to-shore, shore-to-ship and ship-to-ship, causes various practical and technical difficulties to fuel companies, small island communities and bunkering organisations, and these can be costly.

Angus Flexible Pipelines design and construct ship to shore systems which offer reliable, environmentally sound and simple to operate solutions to the problem of transferring fluids in these challenging locations.

No matter how remote or logically difficult, Angus Flexible Pipelines has provided solutions for the transfer of

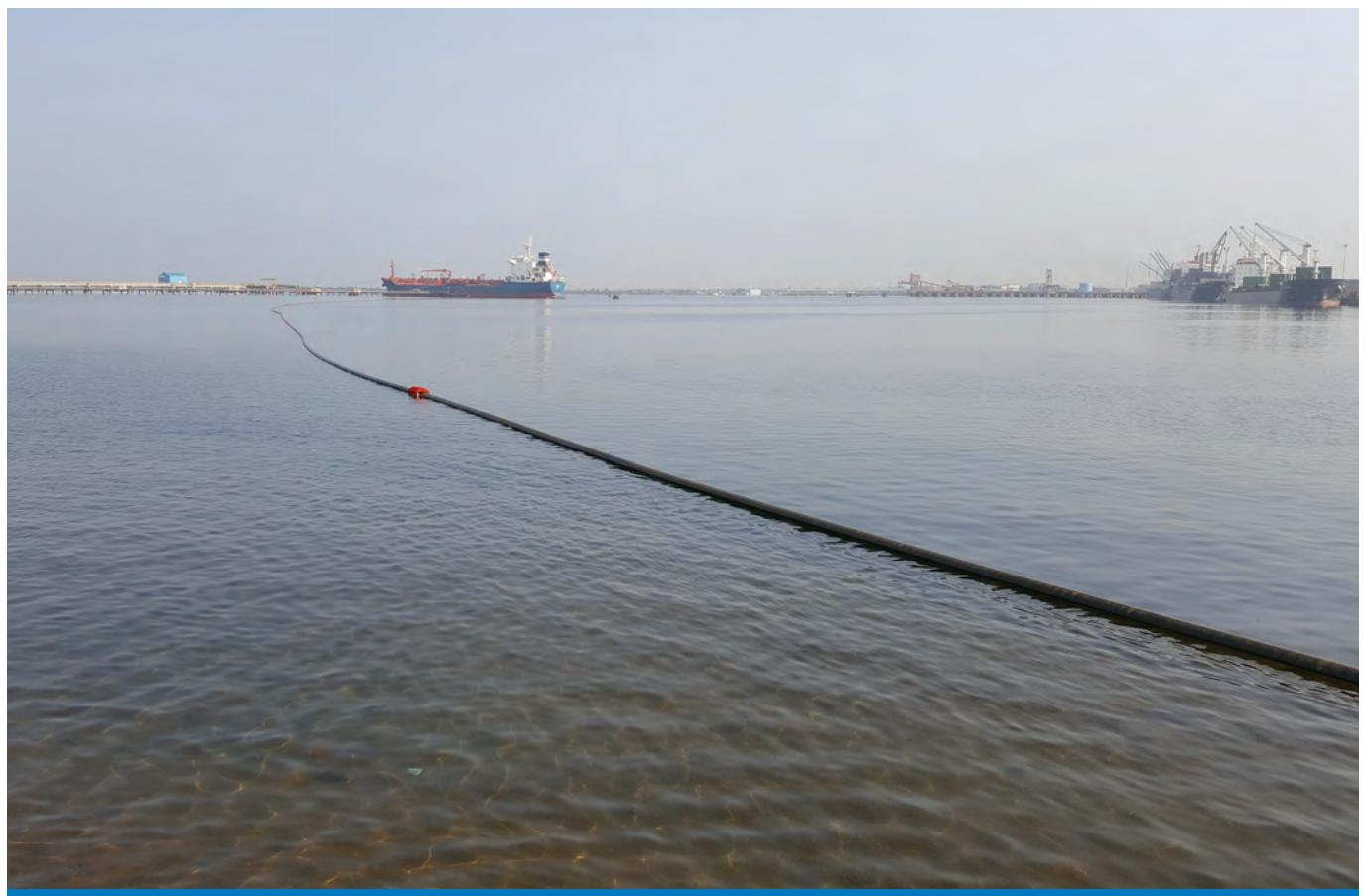


fuels and potable water from tankers to shore storage from the South Sea Islands to Antarctica.

Every situation is unique and requires to be designed and planned individually. We work with you to design the best solution for your particular application; from supply of the hose, to complete bespoke

deployment and retrieval packages, shipboard and shore-side connection, and everything in between.

In addition to fluid transfer systems, working with our sister company Angus Fire, we can also provide the fire protection for storage tanks and distribution depots.



The Angus Flexible Pipelines Ship to Shore System is made up of a number of discrete components. At the heart of the system is the layflat hose, manufactured to the highest quality and suitable for use with the whole range of chemicals, oils and fuels. Angus hoses, mounted on reels are ideal for storage, deployment and retrieval. Using pigging systems ensures the lines are suitably purged after use. Further levels of sophistication can be added with breakaway/quick release couplings.

Offshore 850

Offshore 850 is a flexible layflat hose for all types of marine and offshore supply operations and features antistatic wires incorporated into its construction to dissipate static electricity.



Tough and durable, with exceptional resistance to abrasion, for use in a variety of conditions, Offshore 850 has floating capability and is resistant to heat, fuels, chemicals, UV, ozone, weathering, hydrolysis, and microbiological attack.

Offshore 850 is available in green and orange to differentiate between fluids being transferred.

Manufactured in compliance with BS EN ISO 900. Polymer approved to USA Food & Drug Administration CFR 177.2600 for conveying foodstuffs (orange version only). Approved by Lloyd's Register of Shipping.



Why layflat hose?

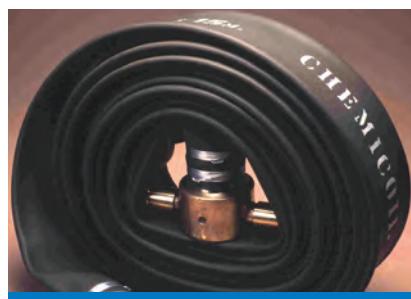
In many fluid transfer applications the use of rigid pipe introduces severe limitations which can be overcome by the use of layflat hoses. The speed of deployment and retrieval using layflat hose can reduce the time spent on station greatly and pigging and reeling can be done "post" ship departure. The small storage foot print and the ability to float on water are further benefits of layflat hose.

The layflat hoses from Angus Flexible Pipelines are manufactured from high tensile synthetic yarns which are circular woven and then totally encapsulated in a tough elastomeric cover and lining. This construction gives the hose exceptional strength and hydraulic efficiency.



Chemicoil 600

A robust but light weight hose designed for ease of use as a bunkering hose for petrol, diesel and low viscosity oils. Ideal for in-shore based installations Chemicoil 600 features antistatic wires incorporated into its construction to dissipate static electricity.



Super Aquaduct

Super Aquaduct is a water transfer hose approved to international standards such as NSF in North America and Regulation 31 in the UK. Resistant to UV, ozone, weathering, and microbiological attack Super Aquaduct is the ideal hose to use in emergency and temporary drinking water supply operations.



Hose Deployment and Retrieval Units

Angus Flexible Pipelines offers a wide range of both trailer and skid mounted systems.

These are usually customised solutions designed to suit the particular requirements of individual applications and environmental conditions.



Couplings and Ancillary Equipment

The usual coupling recommendation is to use swaged fittings; although, field fittable options are also common. To further enhance the system breakaway and quick release couplings are frequently added to the hose lines.



Pigging Units

Displacement and evacuation kits consist of a pig launcher, pig receiver and pig. The kit is designed to remove liquid from the hose line by propelling a pig through the hose line under air or nitrogen pressure.

These are compact solutions, typically much smaller than the equivalent hard hose equipment.



The system can be further complemented with floatation collars, floats and buoys. More sophisticated solutions are available incorporating a remote barge to handle the hose recovery and pigging hardware. Operating in this manner minimises the time the ship is on station.



Angus Flexible Pipelines

Angus Flexible Pipelines has supplied many ship-to-shore, shore-to-ship, ship-to-ship solutions around the world. From the Antarctic Research Units of the USA, Great Britain, Australia and Japan to Island nation projects such as Nauru, Ascension Island and Norfolk Island.

Angus Flexible Pipelines solutions are in regular use with commercial organisations such as the Liberian Petroleum Storage Company (LPSC), who supply fuel into more challenging locations such as Liberia. (Case studies available from our website). Angus supplies fuel transfer systems to Nato and other military forces.



In addition to ship to shore solutions Angus Flexible Pipelines offers a wide range of products to suit a whole range of industries. From ground water abstraction applications to irrigation, from military fuel logistics to air-conditioning systems the range of applications for flexible pipelines is almost endless. For more information on other applications and products visit www.flexiblepipelines.co.uk



Angus Flexible Pipelines Profile

Angus Flexible Pipelines has been at the forefront of layflat hose technology for over 40 years. Formed in 1970 as a division of Angus Fire, Angus Flexible Pipelines pioneered the development of Irrigation Hose, a high tensile, long length hose for use with travelling irrigators. This was followed by Offshore 850 and Chemicoil for delivering fuel and chemicals, Super Aquaduct for delivering potable water, and Wellmaster, which is now the world's premier flexible rising main.

Angus Flexible Pipelines continues to invest in hose technology, which is carried out in an international network of hose technical centres in the UK and Australia. The company's breadth and depth of experience is unsurpassed in the industry.