A day in the life

A brief description of a typical shuttle tanker mooring and loading operation, in this case via a bow loading connection and with an FPSO providing the oil

On approaching the FPSO to load cargo, at a distance of, say, 10 km, the shuttle tanker switches to "standby" mode and shipboard personnel bring their routine "at sea" tasks to a halt in order to commence their shuttle tanker duties. Communications links with the FPSO are activated and tested. Onboard equipment specific to shuttle tankers - including generators, bow thrusters, stern thrusters, the second steering gear, the DP system, hydraulics for the loading connection, chain stopper and traction winch - are all tested. The chief mate and his bow loading team take their place in the tanker bow, while the chief engineer is also likely to be hovering here.

In the zone
As the shuttle tanker enters into the so-called "500-metre" zone, it comes under the authority of the FPSO. Procedures agreed by the FPSO duty holder and the shuttle tanker operator for entry into this zone come into play. This shuttle tanker is fitted with a bow house, and during the approach to the installation, the master has moved from the bridge to bow house, to which control of the tanker has been transferred. As the wave heights do not exceed 4.5 metres, the procedure for passing the polypropylene hawser and loading hose to the shuttle tanker and making the connection is initiated, with a support vessel in attendance. The hawser has a chain section and some shackle links at its inboard end.
The hawser and loading hose are connected at their free ends to a tri-plate to which a thick mooring line is also attached. This, in turn, is connected to a thinner line and so on until the firing line. The total length can be typically 300 metres and the firing line part is coiled on the aft deck of the support vessel.
When within the 500-metre zone, shuttle tanker's DP capability is operative. The shuttle tanker positions itself down weather and in line with the FPSO some 200 metres distant from it.

Winching in
After the support vessel fires the firing line onto the shuttle tanker's forecastle, the hawser connection section is separated from the firing line and led through the bow loading opening, over the chain stopper, round the traction winch and onto the storage reel. By pulling the line in, the shuttle tanker is inched towards the loading installation. This continues until the triplate is at the bow loading roller.
The loading hose is then disconnected and hung off while the hawser is pulled in with the chain section located in the chain stopper. The inboard end of the hawser is disconnected at the shackle, leaving the chain portion in the chain stopper and the section used for pulling-in stored on the reel. This ensures that if the chain stopper is opened during an emergency, the hawser will release and not remain connected to the vessel via the reel. The loading hose can then be positioned for the shipboard connection.
The shuttle tanker master is responsible for manoeuvring the vessel towards the installation as the hawser and loading hose are winched in. The chief officer and his bow team are responsible for the 'hands-on' operation of winching in the hawser and loading hose and making the final connections. The engine room is manned but on bridge control/DP.

The shuttle tanker is maintained in position either using DP or having the master exercising manual control to ensure the required hawser tension with a slight astern movement of the propeller.

Loading operations

Before loading can commence, interlocks in the system have to be checked using radio telemetry. If a problem arises, loading is automatically stopped. In addition, there are two manually operated emergency shutdown (ESD) systems, the second of which also disconnects the ship. The ESD systems can be activated from either the shuttle tanker or the FPSO.

Cargo loading can be controlled from either the bow house or the bridge, while topping off is done from the cargo control room. During loading, the master is responsible for keeping the vessel in position, while the chief officer oversees cargo-handling operations.

Disconnection is the reverse of connecting, with the chief officer and his bow team in the forecastle area doing the 'hands-on' operation of disconnection. The shuttle tanker remains under the control of the FPSO until outside the 500-metre zone. From there to the discharge port normal watchkeeping duties will be kept.

Operational intensity

Shuttle tankers and their crews have busy work schedules. It is not unusual for a shuttle tanker serving in the North Sea to make round trips in six to seven days, with loading and discharge operations each taking 24 hours. This equates to about 55 round trips per year.

Crews need to carry out general "sea" duties as well as specific shuttle tanker operations in rapid succession. Familiarity with the functioning of DP systems is essential part of this mix for several key crew members. All these requirements must be reflected in shuttle tanker training courses which are as rigorous as any in shipping.