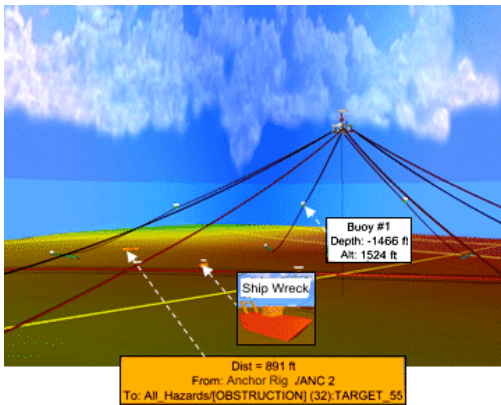


# STARFIX.MOOR®



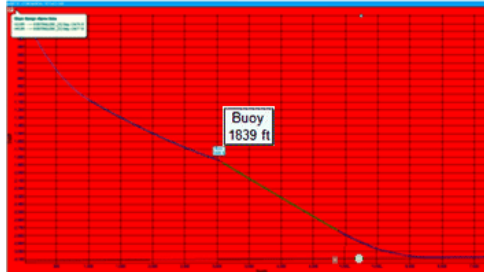
Performing safe and efficient mooring operations has become challenging as anchor rig operations continue to migrate into deeper water depths and into fields with existing seafloor assets. When seafloor hazards are within the anchor spread, it is critical to monitor the rig's mooring lines relative to these hazards for the duration of mooring operations. Offshore survey company Fugro Chance Inc. along with mooring specialist Delmar Systems, Inc. have partnered to develop a mooring position software called STARFIX.MOOR to assist the rig-mover. STARFIX.MOOR, when integrated with STARFIX.NAV®, Fugro's positioning package, is a computation engine and visualization environment. This service provides real-time in-situ positioning and monitoring of the rig, Anchor Handling Vessels (AHV's), and 3D "visualizations" of the mooring lines in relation to the seafloor and those assets that reside on it.

With the ability to compute straight line, real-time catenaries of each mooring line during deployment, STARFIX.MOOR provides information in an innovative way to assist the rig-mover. To present this information in an intuitive and comprehensible manner, STARFIX.MOOR utilizes HydroVista®, a module of Fugro's STARFIX® Suite, to provide a 3D representation of the entire subsea environment. Critical data such as clearance estimates to pipelines and other seafloor assets, along with other numerical information can be highlighted and labeled.



Hydrovista depiction. Shown are enlarged billboards identifying objects and alarm message.

STARFIX.MOOR's computation engine utilizes the industry proven Delmar DelCat catenary algorithms to compute the straight line profiles of each mooring line. Through integration with STARFIX.NAV, the software has positions of each fairlead and AHV position along with each anchor's state. The software also has the ability to account for the physical properties of the mooring components, including anchors, buoys, and workwire, along with inputs of payouts of rig and AHV winches. STARFIX.MOOR is able to compute a straight line 3D profile of each mooring leg. STARFIX.MOOR also provides 2D profiles of each mooring leg along with the ability to create audible and visual alarms when predetermined minimum clearances are reached.



STARFIX.MOOR 2D profile window with enlarged

STARFIX.MOOR can base each mooring line computation on any two of three observables: **scope** (the horizontal distance dynamically defined by the positions of fairlead and AHV), **payouts**, and **tension**.

Payout observables are brought into the STARFIX.MOOR system by interfacing the vessel's counter system. Alternately, another option is utilizing a wireless handheld computer which is operated by the anchor handling personnel. The handheld PC's are used to provide payout information of the rig's fairlead winches and, by integrating with Fugro's DRONE® system, they also provide workwire data from the AHV's. Payout tallies can easily be seen on STARFIX.MOOR's displays, reducing a need for voice communications and providing a consolidated view of all payouts to the rig-mover.



