Liquefied Natural Gas (LNG) Shore to Ship Bunkering Station

CLIENT:

Harvey Gulf International Marine, LLC

LOCATION:

Port Fourchon, LA

INDUSTRY:

Liquefied Natural Gas

PRODUCTS AND SYSTEMS:

- Mustang Intelligent Vaporizer Sampling System® - Model 2
- Mustang Certiprobe® Sample Extractor
- Mustang® Vacuum Jacketed Tubing
- Mustang® Vaporizer
- SoftView® LNG Monitor

THE BACKGROUND

Harvey Gulf International Marine, LLC is a marine transportation company that specializes in providing Offshore Supply and Multi-Purpose Support Vessels for deepwater operations in the U.S. Gulf of Mexico. Harvey Gulf is founded on the premise that superior performance and safer operations provide its customers value and satisfaction.

Harvey Gulf achieves superior performance by designing and equipping its vessels to meet their customers' current and anticipated needs for deepwater operations. This results in providing customers with the largest cargo capacities for offshore supply services and greatest capability and flexibility for offshore construction services. Harvey Gulf also designs and equips some of its offshore supply vessels for dual operation as dive/construction and mooring line support vessels, affording greater flexibility to its customers.

Harvey Gulf's fleet represents a state of the art collection of offshore support vessels ranging from 175 feet to 340 feet, encompassing supply vessels, fast supply vessels, and construction vessels powered by the latest technology available with industry leading cargo handling capabilities. Harvey Gulf's focus on the environment is further exemplified by the 6 dual-fueled LNG powered offshore supply vessels under construction as well as the first of its kind, LNG fueling facility in Port Fourchon, LA.

THEIR CHALLENGE

Harvey Gulf International Marine constructed the first Liquefied Natural Gas (LNG) marine fueling facility in the United States located at its vessel facility in Port Fourchon, LA. The fueling facility is a vital addition to the growing national LNG supply infrastructure, supporting critical operations of the oil and gas industry's offshore support vessel fleet operating on clean burning natural gas.

The facility will consist of two sites each having 270,000 gallons of LNG storage capacity. The tanks will be stainless steel Type 'C' pressure vessels with vacuum insulation and carbon steel exteriors. Each facility will be able to transfer 500 gallons of LNG per minute. Aside from the facilities primary role of supporting the Oil

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and Gas Industry, the facility will be capable of supporting over-the-road vehicles that are operating on Liquefied Natural Gas.

To support the development of the LNG fueling facility, Harvey Gulf needed to secure a partner who had in-depth expertise and knowledge of LNG Shore to Ship Bunkering Stations. A partner that has in-depth knowledge of the GIGNL LNG Custody Transfer Handbook, a partner that understands the methods for continuous and intermittent sampling of LNG as well as a partner who understands cryogenic sample probes and valves, insulation, vaporizers, gas analyzers, and the methods to effectively deploy them into a single, Analytically Accurate® System. **That PARTNER is MUSTANG SAMPLING.**

THE MUSTANG SAMPLING **SOLUTION**

Mustang Sampling, LLC is the innovator of Analytically Accurate® Technology and Solutions within sample conditioning systems. Harvey Marine recognized Mustang Sampling was prepared with a solution to their problem from the beginning of the project. Mustang Sampling understands the challenges of commissioning an LNG facility and the requirements of LNG Shore to Ship Bunkering Stations. The design and accuracy of the LNG sampling system is critical to the proper determination of the fuel's gross caloric value and the methane number (an important engine requirement) of the LNG being transferred.

Mustang Sampling's world-renowned sample conditioning systems and vaporizers are critical components in the industry's overall energy measurement infrastructure. Mustang Sampling has a long history of LNG

sampling, starting with efforts to import LNG into the United States during the 1990's. Mustang Sampling continues to provide best-in-class technologies for small and large scale LNG custody transfer.

The patented Mustang Sampling Vaporizer provides the core for a variety of sample conditioning systems suitable for cryogenic service. Mustang Sampling's focus is delivering a representative sample from the pipeline to the analytical equipment intact, using an "analytical accurate" approach. This insures the sample reaching the analyzer used to characterize the gas is truly representative of the product in the pipeline or tank.

The system for Harvey Gulf was required to measure a Methane Number to insure proper performance in the ship engines. A flanged Mustang Certiprobe® Sample Extractor was used to extract LNG from the fuel line. The Certiprobe is specially designed to allow for the proper transfer of LNG without disturbing the flow pattern. The LNG flows through a Mustang® Vacuum Jacketed Tubing (to provide maximum insulation) to a Mustang Intelligent Vaporizer Sampling System® - Model 2, where it is flash vaporized. The pressure is then reduced using a Mustang® Heated Regulator (part of the Model 2 system) before being delivered to a Rosemount Analytical Danalyzer Gas Chromatograph. The entire process is carefully controlled and recorded using Mustang Sampling's SoftView® LNG Monitor software.

Analytically Accurate®
TECHNOLOGY

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