

5 TECHNICAL DESCRIPTION-STANDBY VAPORIZER

5.1 General

CBI proposes two options for adding 100 percent standby LNG vaporization capacity to the existing facility at Easley, South Carolina. Option A is the addition of a 12MMSCFD direct-fired vaporizer with associated piping, civil, instrumentation, controls and electrical. Option B is the addition of a 12MMSCFD indirect-fired vaporizer with associated piping, civil, instrumentation, controls, and electrical described herein. The Process Flow Sheet and Piping and Instrumentation Diagrams for each option are presented at the end of this section.

5.2 Siting and General Arrangement

The Plot Plan for the facility is also shown at the end of this section. Using different line types to distinguish between the two, both options are shown on the same Plot Plan.

A:5.3 OPTION A - Direct-fired LNG Vaporization System

A:5.3.1 General

A direct-fired vaporization system designed to deliver 12 MMSCFD of vaporized LNG is proposed as a 100 percent stand-by for two existing units. The system consists of a direct-fired vaporizer fueled by natural gas.

Since FHNGA is familiar with the operation of direct-fired vaporizers, the operation of this unit will not be described in detail in this proposal.

A:5.3.2 Vaporizer

The vaporizer is designed to vaporize and superheat 12 MMSCFD at a discharge temperature of 60 degrees F. The vaporizer is designed to operate from the design capacity to a 4:1 turndown capacity.

To control the vaporizer, both the LNG flowrate and the outlet temperature of the natural gas is monitored. The flame is controlled to maintain the vaporized LNG discharge temperature at 60 degrees F. As a secondary feed-forward type control function, the flame rate is also controlled by the incoming LNG flow rate to anticipate and dampen temperature changes in the outlet gas.

The vaporizer will be equipped with a 15HP combustion air blower.

The unit will be equipped with the following alarms and shutdowns:

- o high natural gas outlet temperature
- o low natural gas outlet temperature
- o low air pressure
- o low fuel gas pressure
- o high fuel gas pressure
- o flame failure

A:5.3.3 Instrumentation and Controls

The vaporizer instrumentation and controls will be compatible with that described in Section 4 of this proposal.

A:5.4 Electrical

A:5.4.1 Distribution

480V, 3 phase, 60 Hz power will be required for the combustion air blower.

120V, 1 phase, 60 Hz power will be required for the vaporizer control circuits and supplementary process area lighting.

A:5.4.2 Wiring

CBI will provide and install new wiring from the control room to vaporizer. All power and control wiring will be in conduits. The conduits will be either above ground or under ground depending upon the site requirements.

A:5.4.3 Lighting

Supplementary process area lighting will be installed near the new vaporizer.

A:5.5 Piping and Insulation

All piping design, material, and fabrication will be in accordance with CBI piping standards which meet or exceed ANSI B31.3 standards.

The insulation for cryogenic piping will be preformed polyurethane blocks with galvanized steel jacket. The jacketing will be installed on straight run of pipe only.

A:5.6 Structural

Pipe and equipment support structural will consist of new structures or modification of existing structural supports.

A:5.7 Fire Protection

CBI does not propose to modify the existing fire protection system.

A:5.8 Foundations, Drainage and Civil Structures

Foundations and civil structures will be designed in accordance with generally accepted civil and structural engineering practices. The bearing pressure of 2,000 psf is assumed for the design.

All piping will be installed on sleepers. The existing rain water drainage system will be maintained.

A:5.9 Painting

Uninsulated carbon steel pipe, steel pipe supports, exposed structural steel, ladders, platforms, walkways and other exposed carbon steel items will be shop or field cleaned by abrasive blasting per SSPC-SP6 (commercial blast) and primed with one (1) coat of primer per Federal Specification TT-P-86, Type II to a nominal Dry Film Thickness (DFT) of 1.5 mils.

After installation, weld seams and abraded areas will be cleaned per SSPC-SP2 (Hand Tool Cleaning) and patch coated with primer. Finish painting will be two (2) coats of medium to high gloss alkyd resin paint at a nominal DFT of 1.5 mils per coat.

Equipment will be supplied painted to manufacturers' standard specifications.

A:5.10 Estimated Utilities

The estimated utilities consumption for the new equipment is given in the following table. Actual energy requirements will vary depending on final selection of equipment and operating procedures and conditions.

OPTION A: ESTIMATED OPERATING UTILITIES
ELECTRICAL EQUIPMENT

EQUIPMENT	TAG NO.	HORSEPOWER		EXPECTED CONSUMPTION
		REQUIRED	INSTALLED	
Blower motor	MH-3	15	15	11.2 KWH/HR

FUEL GAS FIRED EQUIPMENT

EQUIPMENT	TAG NO.	OUTPUT MMBTUH	EXPECTED CONSUMPTION MSCFH
Direct-fired vaporizer	H-3	10.2	9.9