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Operational loading
Refined products such as gasoline and diesel are loaded by barge, ship, rail, or truck, creating toxic vapor emissions. The vapor can have many various characteristics including cleaned/uncleaned, presence of previous product, dedicated service, and top/bottom loading.

Compression & processing
In compression and processing, HAPs such as benzene, toluene, ethyl-benzene, and xylene are eliminated by boosting pressure between 50 to 75 psig. The phase allows recovery of a liquid portion that can be returned to the terminal. A filtering process eliminates water and particulate content.

Natural gas injection
Skid-mounted natural gas is injected into the compressed vapor as assistance or enrichment gas. The system allows for 100% bypass for safe startup/shutdown, an eductor for mixing, and a calorimeter to analyze BTUs and ensure minimum methane content.

Waste heat recovery
The microturbine's CHP module recovers previously wasted heat that can be used to heat buildings, process piping, tankage, or renewable feedstock requiring thermal stabilization. Regulatory thermal CO2 credits can be obtained with the recovered carbon.

Storage
The storage phase is where intermittent loading turns into steady-state fuel generation. In its main-regen-guard system, the main is pressurized and feeds the microturbine, the regen is pressurized from the loading operation, and the guard is on standby for pressurization.

Microturbine
The microturbine's modular design can be configured with multiple 200-KW capacity bays that can be isolated individually for maintenance. At its largest, it has five 200-KW bays for a capacity of 1 MW, which can be combined for a total capacity of 10 MW. The microturbine has a maximum runtime of 40,000 hours (8.5 years) before powerhead rebuild.

After-treatment
The after-treatment module can provide reduction of SOx, CO, and NOx. Emissions are analyzed using a CEMS.

Electricity generation
The VUS creates 480-V, three-phase, clean, prime power for the terminal or plant performing loading operations. The power is fed to a step-up transformer and automatic transfer system. The VUS becomes the main power source for the loading terminal, and grid power becomes backup.

Vapor Upcycle System

Patented vapor recovery solution to meet EPA compliance on routine flaring & achieve sustainable energy

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