Floating Power Generation Solutions

EPC Contractors
Marine Engineers

Delivering unprecedented marine solutions
INNOVATION
Delivering Value through Vision and Innovative Thinking

Since 1974, Waller Marine, Inc. has set the standard for innovation and quality in naval architecture and marine services. As EPC Contractors and Marine Engineers, Waller Marine utilizes the latest technologies in developing Floating Power Plants (FPP) and FPSO designs to meet each client’s specific requirements. With state-of-the-art engineering software, we turn our conceptual designs into a 3D model and virtually walk through the floating power plant to analyze the structure, review regulatory compliance, and resolve design issues before resources are committed to construction. We employ a diverse group of professionals to satisfy the multi-discipline practices associated with design, construction management, regulatory assistance, project development, and contractual compliance. On any given project, a Waller design team is comprised of experts in the disciplines of naval architecture, marine engineering, power plant engineering, and construction.

The depth of experience our personnel hold permits the forging of breakthrough ideas and conceptual designs for the application of traditional land-based generating technologies to a marine environment.

SUSTAINABILITY
Pushing Beyond the Limits

Only at Waller Marine—where our diversified team of engineers and naval architects—will you find unique, sustainable solutions for the design and construction of FPPs and Floating Energy Centers (FECs). The latter being the integration of electrical generating technologies with other commodities such as LNG, fresh water, hydrogen based generation, and the simultaneous production of synthesis gas and chemicals. In the development of our most recent FPP, mounting large industrial gas turbines for operation on a floating structure required an in-depth understanding of the challenges in design and construction of highly damped foundations and supporting structures. Foremost, the associated system dynamics that are at play with a 650-ton turbine-generator rotating at high speed, developing an enormous 230,000 horse power, has to be absorbed by the supporting structures. Subsequently, vibration (during run-up, operation and rundown speeds), high structural loading, resonance, and mass damping issues were also taken into consideration to build a successful platform for the turbine.

Additionally, the turbine foundations are supported by the barge structures that are designed to permit the flow of forces into the hull without overstressing components; while still permitting flexure of the hull girder due to differential weight distribution and thermal gradients. By isolating the turbine foundation from the influences of the barge structure is thus a priority. Our turbine support design philosophy considered these variables with a resulting solution that included a large pre-stressed concrete plinth supported on springs and a system of hydraulic jacks. The plinth, a monolithic reinforced concrete structure, was designed internally with a complex array of rebar and a specially selected concrete mix. This combination produced a high damping capability to absorb the changing vibration induced amplitudes that occur during start up and stop operations, as well as, the structural strength to absorb high loading.

At Waller Marine, we have an extensive portfolio of FPPs using both 60 Hz and 50 Hz gas turbines, ranging from 5 MW to 250 MW in simple cycle mode and up to 500 MW in combined cycle mode. All of our simple cycle FPPs are designed to be easily converted to a combined cycle operation with the addition of a heat recovery and steam turbine generating barge. Let us design a solution, engineer and construct your next offshore support and transportation vessel.

Below deck ventilation systems
Deck drain system
Barge service diesel generator
Barge mooring brackets

Power Plant Equipment and Systems
- Gas turbine cooling fin-fan coolers
- Liquid fuel system (for dual fuel machines)
- Diesel fuel treatment skid (for dual fuel machines)
- Gas fuel system
- Water wash system
- Water injection system (if water injection is required)
- Reverse osmosis system & storage
- Gas receiving station
- CO2 storage and distribution
- Motor control center & switchgear
- Central Control Room and offices with fiber optics
- Central communications system
- Warehouse
- Main step up transformer 11Kv/230Kv
- Auxiliary transformer
- Station transformer
- SF6 Breaker
- Transmission take-off tower
- Gas turbine starting system (water cooled 12 pulse LCI system)
- Fire protection and fire fighting systems
- 30 meter stack
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### BARGE MOUNTED GE 7FA GAS TURBINES

![3D PDMS modelling software used to design the top-side equipment arrangement.](image-url)

**Specifications**

- **NAMES:** Margarita I and Josefa Rufina I
- **EPC CONTRACTOR:** Waller Marine, Inc.
- **BUILDER:** Signal International, Inc.
- **CLASSIFICATION:** ABS
- **CONSTRUCTION:** All welded steel and reinforced concrete foundation
- **LENGTH OVERALL:** 300 feet (91.4m)
- **BREADTH:** 100 feet (30.5m)
- **DEPTH:** 20 feet (6.1m)
- **LIGHTSHIP WEIGHT:** 6,700 Short Tons
- **DESIGN DECK LOAD:** 6,000 psf
- **DECK SQ. FOOTAGE:** 30,000 sf
- **TURBINE GENERATOR TYPE:** GE 7FA
- **GENERATING CAPACITY:** 171 Mega Watts (ISO)—simple cycle

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#### Marine Equipment and Systems

- Ballast system
- Bilge system
- Oily water separators
- Fire pumps; diesel and motor driven
- Marine sanitation device
- Fuel, water, sludge and ballast storage tanks
- Potable water pressure sets
- Domestic hot water system
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