Lunar Tanker Fleet

The Supply Chain for Space

Purpose

The Lunar Tanker Fleet is the logistical backbone of Aegis Station. Its mission is singular but monumental:

Lift 3.3 million metric tons of lunar water into orbit to shield and sustain humanity's first true orbital city.

This fleet enables that goal—not through one giant launch, but through steady, relentless movement. Day after day. Year after year.

Mission Profile

- Surface to orbit water delivery
- Fully autonomous operation
- Cryogenic or pressurized tankage
- Docking-compatible with Aegis Station shield reservoirs

Tankers operate in continuous cycles: launch, orbit, offload, return, refuel, repeat.

Updated Fleet Specifications

Parameter	Value
Number of tankers	45
Payload per trip	45 metric tons
Daily throughput	~2,025 metric tons/day
Target fill time	~4.5 years (3.3M tons total)
Operation mode	Autonomous, rotational cycle

This capacity ensures that shielding keeps pace with phased ring deployment and allows for system redundancy.

Design Characteristics

Tankers are built around the KISS principle—*Keep It Simple, Stupid*—favoring robust mechanical reliability, minimal staging, and simple reusability.

Propulsion Architecture and Performance

The propulsion system is designed to satisfy a tightly defined performance envelope using pressure-fed LOX/CH_4 engines optimized for repeatable lunar operations.

Ascent Performance (Fully Loaded)

- **Payload:** 45,000 kg (water tank)
- **Total launch mass:** ~102,000 kg
- **Δv requirement:** ~2,600 m/s
- **Isp (vacuum):** ~360 s
- **Propellant mass:** ~52,000 kg

Structural & Operational Features

Feature	Description
Structure	Cylindrical 49 m^3 tank cartridge (10 m tall × 2.5 m dia), mounted to a modular systems pod
Landing	VTOL on a dedicated docking platform with alignment and anchor mechanisms
Docking	Compatible with Aegis Station cartridge vestibules or intermediate depots
Propulsion	Pressure-fed LOX/CH_4 engines (2–3× medium or 5–6× small cluster); cold-gas or methane RCS
Power	Solar + battery hybrid with night-cycle autonomy
Automation	Terrain-relative landing, cargo confirmation, orbital alignment, and mission repeatability
Reusability	100+ round trips with field servicing and depot maintenance

Thrust and Return

- **Required thrust (lunar gravity):** ~165 kN
- **Engine cluster:** 3×60 kN or 5–6×35 kN
- **Return mass:** ~7,500 kg
- **Return Δv:** ~1,800 m/s
- **Propellant (return):** ~4,800 kg
- **Total round-trip propellant:** ~57,000 kg (with margin)

Autonomous Flight Operations

Each tanker is fully capable of:

- Navigation and terrain-relative landing
- Payload verification and cartridge swap
- Docking alignment and orbital transfer
- Data relay, self-diagnostics, and remote override

Tankers operate independently or under dispatch control from Aegis Station or lunar ISRU hubs.

Ground Operations: Landing, Reload, Refuel

- Tankers land on fixed docking platforms (not bare regolith)
- Platform includes securing lugs and alignment system
- A robotic arm or gantry removes the **empty** cartridge
- A **full** 45t cartridge is inserted
- The booster is **refueled** and prepared for relaunch
- Tanker returns to Aegis Station and offloads cargo

This cycle repeats ~60–100+ times per year per vehicle.

Integration with Other Systems

- **Aegis Station** – Primary recipient for shielding water

- **ISRU Nodes** – Water extraction and cryogenic loading
- **Aegis-Class Rovers** – Tank handling and pad prep
- **Luna–Aegis Shuttle** – Delivers spares, maintenance tools
- **Orbital Depots** – Optional staging or redistribution

Economic Impact

This fleet establishes the first **industrial-scale lunar orbital supply chain**.

After shielding is complete, it remains a permanent asset:

Post-Fill Roles

- **Depot Resupply** – LLO, EML1/2, orbital hubs
- **Fuel Production** – LOX/LH_2 via in-orbit electrolysis
- **Shielding Services** – For other orbital habitats
- **Life Support Supply** – Water for agriculture, industry, and reserves

Key Metrics (Updated)

Metric	Value
Total shielding mass	3.3 million metric tons
Estimated delivery cost	~$495 billion (@ $150/kg)
Missions per tanker/year	60–100+
Time to completion	~4.5 years