

PHIL: MATURE OPERATIONS MANPOWER MODEL AND LOCATION

"How many people does it take to run Tranquility?"

ORGANIZATIONAL STRUCTURE - MATURE PHASE 1 (3.5 GW, 50 CLIENTS)

TOTAL HEADCOUNT: ~165 FTE

A. OPERATIONS (55 FTE)

Mission: Run the facility 24/7, ensure uptime, handle incidents

Control Center Operations (35 FTE) Location: Earth (co-located with primary base station) 24/7 Shifts:

Shift 1 (00:00-08:00 UTC): 5 people

Shift 2 (08:00-16:00 UTC): 7 people (peak business hours)

Shift 3 (16:00-00:00 UTC): 5 people

Roles per shift:

Operations Manager (1) - senior, final authority on shift

Job Coordinators (2-4) - approve jobs, schedule, monitor

Technical Support (1-2) - troubleshoot failures, optimize

Communication Specialist (1) - manage Earth-Moon links

Total: 17 people × 3 shifts = 51 FTE

Plus:

Operations Director (1) - overall operations leadership

Deputy Director (1) - backup, special projects

Training Coordinator (1) - onboard new ops staff

Process Improvement (1) - optimize workflows

Operations Subtotal: 54 FTE

2. Base Station Technicians (6 FTE)

Locations: 3 primary sites (Goldstone, Madrid, Canberra)

Per site:

Site Manager (1)

Maintenance Tech (1)

Total: 2×3 sites = 6 FTE

(Unmanned sites with quarterly on-site visits, remote monitoring)

3. Lunar Systems Monitoring (6 FTE)

(Separate from control center, focused on Moon-side hardware)

Team:

Lunar Systems Manager (1)

Reactor Monitoring Specialists (2)

Compute Hardware Specialists (2)

Thermal Systems Specialist (1)

Function:

Watch Moon telemetry

Predict failures

Coordinate with robotics for maintenance

Plan container swaps

Lunar Monitoring Subtotal: 6 FTE

B. SALES & ACCOUNT MANAGEMENT (32 FTE)

Mission: Acquire customers, manage relationships, drive revenue

Enterprise Sales (12 FTE) VP of Sales (1)

Owns revenue targets

Strategic partnerships

Enterprise Account Executives (8)

Hunt for new customers

Close deals >\$5M/year

Quota: \$50M/year per AE

Sales Engineers (3)

Pre-sales technical support

Solution architecture

POCs and demos

Sales Subtotal: 12 FTE

2. Account Management (15 FTE)

Director of Customer Success (1)

Strategic Account Managers (10)

1 per major customer (>\$5M/year)

Relationship management

Expansion opportunities

Escalation handling

Customer Success Managers (4)

Handle smaller customers (<\$5M/year)

Each manages 10-15 accounts

Account Management Subtotal: 15 FTE

3. Marketing & Business Development (5 FTE)

Chief Marketing Officer (1) Product Marketing (2) - positioning, messaging, content Demand Generation (1) - conferences, webinars, campaigns Business Development (1) - partnerships, alliances

Marketing Subtotal: 5 FTE

C. ENGINEERING & TECHNICAL (28 FTE)

Mission: Optimize system, plan upgrades, R&D;

Systems Engineering (12 FTE) VP of Engineering (1) Infrastructure Team (6):

Principal Engineer - Compute Architecture (1)

Principal Engineer - Power Systems (1)

Principal Engineer - Thermal Management (1)

Principal Engineer - Communications (1)

Systems Integration Engineers (2)

Software/AI Team (5):

ML Optimization Specialists (3) - help customers tune workloads

Infrastructure Software Engineers (2) - job scheduler, monitoring

Engineering Subtotal: 12 FTE

2. R&D; / Future Technologies (6 FTE)

Director of Research (1) Research Scientists (5)

Track emerging compute technologies

Prototype new architectures

Partner with universities

R&D; Subtotal: 6 FTE

3. Facilities & Lunar Operations Planning (10 FTE)

Director of Lunar Operations (1)

Lunar Infrastructure Team (5):

Civil/Structural Engineers (2) - plan expansions

Robotics Engineers (2) - maintain/upgrade robots

Logistics Planner (1) - launch schedules, cargo

Earth Infrastructure Team (4):

Base Station Engineers (2)

Data Center Engineers (2)

Facilities Subtotal: 10 FTE

D. CORPORATE FUNCTIONS (40 FTE)

Mission: Finance, legal, HR, compliance, IT

Finance & Accounting (12 FTE) CFO (1) Controller (1) Accountants (4) - AR, AP, payroll, reporting FP&A; Analysts (3) - forecasting, budgeting Billing Specialists (3) - customer invoicing, usage tracking Finance Subtotal: 12 FTE

Legal & Compliance (8 FTE) General Counsel (1) Corporate Attorneys (2) - contracts, M&A; Regulatory Compliance (3):

FedRAMP Compliance Manager (1)

ITAR/Export Control Specialist (1)

Privacy/Data Protection (1) Paralegal/Contract Manager (2)

Legal Subtotal: 8 FTE

3. Human Resources (6 FTE)

CHRO (1) Recruiting (2) HR Business Partners (2) Compensation & Benefits (1)

HR Subtotal: 6 FTE

4. IT / Information Security (10 FTE)

CIO/CISO (1) IT Infrastructure (4) - networks, servers, endpoints Security (3) - SOC, compliance, incident response IT Support (2) - helpdesk, user support

IT Subtotal: 10 FTE

5. Corporate Communications (4 FTE)

Head of Communications (1) Public Relations (1) Internal Communications (1) Executive Assistant to CEO (1)

Communications Subtotal: 4 FTE

E. EXECUTIVE LEADERSHIP (10 FTE)

CEO (1) COO (1) CFO (1) - also in Finance above CTO (1) VP Operations (1) - also in Operations above VP Sales (1) - also in Sales above VP Engineering (1) - also in Engineering above General Counsel (1) - also in Legal above CHRO (1) - also in HR above CMO (1) - also in Marketing above

Executive Subtotal: 10 FTE

(Note: Some executives counted in functional areas above - ~3 net new)

PHASE 1 TOTAL: ~165 FTE

Breakdown:

Operations: 65 FTE (40%)

Sales/Marketing: 32 FTE (19%)

Engineering: 28 FTE (17%)

Corporate: 40 FTE (24%)

Revenue per Employee:

Phase 1 Revenue: \$1.2B/year

165 employees

\$7.3M revenue per employee (very high - typical tech company is \$0.5-1M)

Why so lean?

Highly automated operations (Michelangelo!)

Limited customer count (50 vs thousands)

No manufacturing (outsourced)

No physical product distribution

MATURE PHASE 2 (60 GW, 500 CLIENTS) - SCALED MANPOWER

TOTAL HEADCOUNT: ~650 FTE

Scaling factors:

Operations:

65 → 180 FTE (2.8x)

More complex with 17x capacity

More base stations, more monitoring

Sales/Marketing:

32 → 150 FTE (4.7x)

500 clients (10x customers)

More account managers needed

Engineering:

28 → 120 FTE (4.3x)

R&D; for next-gen tech

Larger infrastructure team

Corporate:

40 → 150 FTE (3.75x)

Finance, legal, HR scale with headcount and complexity

Executive:

10 → 50 FTE (5x)

More VPs, directors for larger org

Phase 2 Revenue per Employee:

\$12B revenue / 650 FTE = \$18.5M per employee

Even more efficient at scale!

COST ANALYSIS

Phase 1 Labor Costs:

Average compensation (fully loaded):

Operations: \$120K

Sales: \$180K (high variable)

Engineering: \$200K

Corporate: \$150K

Executive: \$400K

Total annual payroll:

Operations: 65 × \$120K = \$7.8M

Sales: 32 × \$180K = \$5.8M

Engineering: 28 × \$200K = \$5.6M

Corporate: 40 × \$150K = \$6.0M

Executive: 10 × \$400K = \$4.0M

Total: ~\$29M/year

As % of revenue:

\$29M / \$1,200M = 2.4% (incredibly low!)

Typical enterprise software: 20-40%

Reason: Capital-intensive business, not labor-intensive

Phase 2 Labor Costs:

650 FTE at higher average comp (inflation, seniority):

\$150M/year (estimated)

As % of revenue:

$\$150\text{M} / \$12,000\text{M} = 1.25\%$

Even better margins at scale!

COMPARISON TO TRADITIONAL DATA CENTER

AWS-equivalent facility (3.5 GW):

Operations: 300-500 FTE (highly automated, but more sites)

Sales/Support: 1,000+ FTE (millions of customers)

Engineering: 500+ FTE

Corporate: 500+ FTE

Total: 2,000-3,000 FTE

Tranquility at 165 FTE is 10x more efficient because:

50 customers vs millions (less support needed)

Single location (Moon) vs hundreds of data centers

Highly automated (Michelangelo)

No physical infrastructure on Earth (base stations unmanned)

KEY INSIGHTS

Very lean operation - 165 people run \$1.2B/year business

Most headcount in operations (40%) - ensuring uptime is critical

Sales team is strategic, not transactional - high-touch, B2B

Engineering heavy - optimize infrastructure, not build features

Corporate functions standard - legal/compliance especially important

Scales efficiently - Phase 2 only needs 4x headcount for 10x revenue