SCHEDULE BASELINE INSTRUCTION DOCUMENT

Modern Cargo Vessel Construction Project

Document Control

- **Document ID:** SBD-001
- **Version:** 1.0
- **Date:** March 1, 2025
- **Prepared by:** Project Management Office
- **Approved by:** James Harrington, Project Director
- **Classification:** Internal Use Only

---

1. EXECUTIVE SUMMARY

This Schedule Baseline Instruction Document establishes the foundational timeline for the Modern Cargo Vessel Construction Project. The baseline schedule serves as the approved project timeline against which all progress will be measured and controlled.

Key Schedule Parameters:

- **Project Duration:** 24 months
- **Start Date:** March 1, 2025
- **Completion Date:** February 28, 2027
- **Critical Path Duration:** 24 months
- **Total Activities:** 847 activities
- **Major Milestones:** 12 key milestones

---

2. SCHEDULE BASELINE OVERVIEW

2.1 Project Phases

The project schedule is organized into six major phases:

1. **Pre-Construction Phase** (Months 1-3)
2. **Design & Engineering Phase** (Months 1-8)
3. **Procurement Phase** (Months 4-12)
4. **Construction Phase** (Months 6-22)
5. **Testing & Commissioning Phase** (Months 20-24)
6. **Delivery & Handover Phase** (Month 24)

2.2 Work Breakdown Structure (WBS)

```
1.0 Modern Cargo Vessel Construction Project
├── 1.1 Pre-Construction
├── 1.2 Design & Engineering
├── 1.3 Procurement
├── 1.4 Construction
├── 1.5 Testing & Commissioning
└── 1.6 Delivery & Handover
```

---

3. DETAILED SCHEDULE PHASES

3.1 PRE-CONSTRUCTION PHASE (Months 1-3)

Objectives: Establish project foundation, obtain permits, prepare facilities

Key Activities:

- **Week 1-2:** Project mobilization and team setup
- **Week 3-4:** Site preparation and infrastructure setup
- **Week 5-8:** Permit applications and regulatory approvals
- **Week 9-12:** Facility preparation and equipment installation

Critical Dependencies:

- Environmental impact assessment approval
- Construction permit issuance
- Dry dock availability confirmation
- Key personnel recruitment completion

Deliverables:

- Project charter signed
- All permits obtained
- Site fully prepared
- Project team mobilized

3.2 DESIGN & ENGINEERING PHASE (Months 1-8)

Objectives: Complete all vessel design work and obtain approvals

Parallel Work Streams:

Stream A: Naval Architecture (Months 1-6)

- **Month 1-2:** Concept design and preliminary specifications
- **Month 3-4:** Detailed hull design and stability calculations
- **Month 5-6:** Hydrodynamic analysis and optimization

Stream B: Structural Engineering (Months 2-7)

- **Month 2-3:** Structural analysis and scantling calculations
- **Month 4-6:** Detailed structural drawings

- **Month 7:** Structural review and approval

Stream C: Systems Design (Months 3-8)

- **Month 3-5:** Propulsion system design
- **Month 4-6:** Electrical system design
- **Month 5-7:** HVAC and auxiliary systems design
- **Month 6-8:** Integration and final reviews

Critical Path Activities:

- Hull form optimization (Week 4-8)
- Structural drawings approval (Week 16-20)
- Systems integration review (Week 24-28)
- Classification society approval (Week 28-32)

Quality Gates:

- Design Review 1: Concept approval (Week 8)
- Design Review 2: Preliminary design (Week 16)
- Design Review 3: Detailed design (Week 24)
- Design Review 4: Final approval (Week 32)

3.3 PROCUREMENT PHASE (Months 4-12)

Objectives: Procure all materials, equipment, and services

Procurement Categories:

Category A: Long-Lead Items (Months 4-10)

- **Main engine procurement:** 6 months lead time
- **Generator sets:** 4 months lead time
- **Navigation equipment:** 5 months lead time
- **Specialized pumps and compressors:** 4 months lead time

Category B: Steel and Raw Materials (Months 6-9)

- **Hull steel plates:** 3 months lead time
- **Structural sections:** 2 months lead time
- **Piping materials:** 2 months lead time

Category C: Standard Items (Months 8-12)

- **Electrical components:** 2 months lead time
- **HVAC equipment:** 3 months lead time
- **Safety equipment:** 1 month lead time
- **Outfitting materials:** 2 months lead time

Procurement Milestones:

- **Month 4:** Long-lead item orders placed
- **Month 6:** Steel orders placed
- **Month 8:** Standard equipment orders placed

- **Month 10:** First deliveries commence
- **Month 12:** All materials on-site

3.4 CONSTRUCTION PHASE (Months 6-22)

Objectives: Complete vessel construction and systems installation

Stage 1: Hull Construction (Months 6-14)

- **Month 6-7:** Steel cutting and preparation
- **Month 7-9:** Block assembly
- **Month 9-11:** Hull erection and welding
- **Month 11-12:** Superstructure construction
- **Month 12-14:** Hull completion and painting

Stage 2: Systems Installation (Months 12-20)

- **Month 12-15:** Main engine installation
- **Month 13-16:** Auxiliary equipment installation
- **Month 14-18:** Electrical systems installation
- **Month 16-19:** HVAC systems installation
- **Month 17-20:** Navigation equipment installation

Stage 3: Outfitting (Months 18-22)

- **Month 18-20:** Interior outfitting
- **Month 19-21:** Accommodation areas completion
- **Month 20-22:** Final systems integration
- **Month 21-22:** Pre-commissioning activities

Construction Milestones:

- **Month 7:** Keel laying ceremony
- **Month 11:** Hull launch
- **Month 15:** Main engine operational
- **Month 20:** Systems integration complete
- **Month 22:** Construction complete

3.5 TESTING & COMMISSIONING PHASE (Months 20-24)

Objectives: Test all systems and obtain certifications

Testing Sequence:

- **Month 20-21:** Dock trials and system testing
- **Month 21-22:** Harbor trials
- **Month 22-23:** Sea trials
- **Month 23-24:** Certification and final inspections

Testing Activities:

- **System commissioning:** All onboard systems tested individually
- **Integration testing:** Systems tested together

- **Performance trials:** Speed, fuel consumption, maneuvering tests
- **Safety drills:** Emergency procedures and equipment tests
- **Regulatory inspections:** Flag state and classification society surveys

3.6 DELIVERY & HANDOVER PHASE (Month 24)

Objectives: Complete vessel delivery and project closure

Final Activities:

- **Week 93-94:** Final inspections and punch list completion
- **Week 95-96:** Documentation handover and crew training
- **Week 96:** Vessel delivery and project closure

---

4. CRITICAL PATH ANALYSIS

4.1 Critical Path Activities

The project critical path consists of the following key activities:

1. **Design completion and approval** (Weeks 1-32)
2. **Main engine procurement** (Weeks 16-40)
3. **Hull construction** (Weeks 24-56)
4. **Main engine installation** (Weeks 48-60)
5. **Systems integration** (Weeks 72-80)
6. **Sea trials** (Weeks 88-92)
7. **Final delivery** (Week 96)

4.2 Critical Path Duration

- **Total Critical Path Duration:** 96 weeks (24 months)
- **Float Available:** 0 weeks for critical path activities
- **Schedule Risk:** High - any delay on critical path affects delivery

4.3 Schedule Buffers

- **Project buffer:** 4 weeks built into overall schedule
- **Feeding buffers:** 2-week buffers for non-critical activities
- **Resource buffers:** 1-week buffers for resource-constrained activities

---

5. RESOURCE PLANNING

5.1 Labor Resource Profile

Peak Resource Requirements (Month 12-16):

- **Project Management:** 8 FTE
- **Engineering:** 25 FTE

- **Production Workers:** 120 FTE
- **Quality Control:** 12 FTE
- **Support Staff:** 15 FTE
- **Total Peak:** 180 FTE

Resource Ramp-up:

- **Months 1-3:** 25% of peak resources
- **Months 4-8:** 50% of peak resources
- **Months 9-18:** 100% of peak resources
- **Months 19-22:** 75% of peak resources
- **Months 23-24:** 40% of peak resources

5.2 Equipment and Facility Requirements

Major Equipment Schedule:

- **Dry dock reservation:** Months 6-22
- **Heavy cranes (400T):** Months 9-20
- **Welding equipment:** Months 6-18
- **Testing equipment:** Months 20-24

---

6. RISK MANAGEMENT

6.1 Schedule Risks

High-Impact Risks:

1. **Steel delivery delays** - Impact: 4-6 weeks
2. **Main engine delivery delays** - Impact: 8-12 weeks
3. **Weather delays during construction** - Impact: 2-4 weeks
4. **Regulatory approval delays** - Impact: 4-8 weeks
5. **Skilled labor shortage** - Impact: 6-10 weeks

Risk Mitigation Strategies:

- Multiple supplier options for critical materials
- Early ordering of long-lead items
- Weather contingency planning
- Proactive regulatory engagement
- Labor resource planning and training programs

6.2 Schedule Recovery Options

Fast-Track Options:

1. **Parallel work streams** - Save 2-4 weeks
2. **Overtime work** - Save 1-3 weeks
3. **Additional resources** - Save 2-6 weeks
4. **Scope reduction** - Save 4-12 weeks (if approved)

---

7. MONITORING AND CONTROL

7.1 Progress Reporting

Reporting Frequency:

- **Daily:** Production progress updates
- **Weekly:** Schedule status reports
- **Monthly:** Comprehensive progress reports
- **Quarterly:** Executive dashboard updates

Key Performance Indicators (KPIs):

- **Schedule Performance Index (SPI)**
- **Critical Path Status**
- **Milestone Achievement Rate**
- **Resource Utilization Rate**
- **Schedule Variance**

7.2 Change Control Process

Schedule Change Authority:

- **Minor changes (<1 week):** Site Manager approval
- **Moderate changes (1-4 weeks):** Project Director approval
- **Major changes (>4 weeks):** Steering Committee approval
- **Critical path changes:** Client approval required

7.3 Recovery Actions

When SPI < 0.90:

1. Conduct detailed schedule analysis
2. Identify root causes of delays
3. Develop recovery plan
4. Implement corrective actions
5. Monitor progress closely

---

8. COMMUNICATION PLAN

8.1 Schedule Communications

Stakeholder Communication Matrix:

Stakeholder	Frequency	Format	Content
Client	Weekly	Report + Meeting	Progress, issues, forecasts
Senior Management	Monthly	Dashboard	KPIs, milestones, risks
Project Team	Daily	Stand-up	Daily progress, obstacles

Stakeholder	Frequency	Format	Content
Suppliers	Weekly	Coordination meeting	Delivery schedules, issues
Regulatory Bodies	Monthly	Status update	Compliance progress

8.2 Escalation Procedures

Schedule Issue Escalation:

- **Level 1:** Project scheduler (immediate issues)
- **Level 2:** Project manager (>2 day delays)
- **Level 3:** Project director (>1 week delays)
- **Level 4:** Steering committee (critical path impacts)

---

9. BASELINE APPROVAL AND CHANGE CONTROL

9.1 Baseline Approval

This schedule baseline is approved by:

Project Sponsor: [Signature] _____ Date: _____

Project Director: [Signature] _____ Date: _____

Client Representative: [Signature] _____ Date: _____

9.2 Baseline Change Control

Any changes to the approved schedule baseline must follow the formal change control process:

1. **Change Request Submission**
2. **Impact Analysis**
3. **Stakeholder Review**
4. **Approval Decision**
5. **Baseline Update**
6. **Communication**

---

10. APPENDICES

Appendix A: Detailed Activity List

[Reference to comprehensive activity breakdown]

Appendix B: Resource Histograms

[Charts showing resource loading over time]

Appendix C: Risk Register

[Detailed schedule risks and mitigation plans]

Appendix D: Milestone Dictionary

[Detailed descriptions of all project milestones]

Appendix E: Schedule Assumptions

[Complete list of schedule planning assumptions]

Document Control Information:

- **Next Review Date:** April 1, 2025
- **Distribution:** Project team, client, key stakeholders
- **Storage Location:** Project SharePoint portal
- **Retention Period:** 7 years post-project completion
