

# PREVENTIVE MAINTENANCE COMPLIANCE SCHEDULE

**Polar Dynamics Robotics, Inc.**

*Effective Date: January 1, 2024*

*Document Reference: PDR-PM-2024-001*

## 1. PURPOSE AND SCOPE

1. This Preventive Maintenance Compliance Schedule ("Schedule") establishes the mandatory maintenance protocols and compliance requirements for all Polar Dynamics Robotics, Inc. ("Company") autonomous mobile robot ("AMR") systems operating in temperature-controlled environments.

2. This Schedule applies to all IceNav(TM)-enabled AMR units, associated control systems, and thermal management components manufactured and deployed by the Company.

## 2. DEFINITIONS

1. "Critical Components" means the proprietary cold-resistant actuators, thermal management systems, and navigation sensors integral to AMR operation.

2. "Maintenance Interval" refers to the prescribed period between required preventive maintenance activities.

3. "Operating Environment" means any controlled temperature space between +25 C to -40 C where Company AMRs are deployed.

## 3. MAINTENANCE CATEGORIES AND INTERVALS

### 1. Level 1 - Daily Operational Checks

- Visual inspection of external housing integrity
- Verification of thermal seal functionality
- Battery charge level assessment
- Basic movement and response testing
- Operating temperature log review

### 2. Level 2 - Weekly System Diagnostics

- IceNav(TM) calibration verification
- Actuator response time testing
- Thermal management system performance check
- Navigation sensor alignment confirmation
- Emergency stop system validation

### 3. Level 3 - Monthly Component Inspection

- Detailed actuator wear analysis
- Thermal coating integrity assessment
- Power distribution system evaluation
- Software version verification
- Safety system comprehensive testing

### 4. Level 4 - Quarterly Major Service

- Complete system disassembly and inspection
- Thermal management system deep cleaning
- Actuator lubricant replacement
- Control board diagnostic testing
- Full system calibration and certification

## **4. COMPLIANCE REQUIREMENTS**

### 1. Documentation Requirements

- All maintenance activities must be logged in the Company's digital maintenance tracking system
- Maintenance technicians must maintain current certification
- Photographic documentation required for Level 3 and 4 services
- Non-conformance reports must be filed within 24 hours of discovery

### 2. Quality Assurance

- Random audits of maintenance records conducted quarterly
- Third-party verification of Level 4 service completion
- Annual compliance review by Quality Control Department
- Maintenance trend analysis and reporting

## **5. SPECIAL CONSIDERATIONS**

### **1. Cold Environment Operations**

- Additional thermal system checks required for units operating below -30 C
- Enhanced actuator testing frequency in extreme cold conditions
- Specialized lubricant verification every 30 days
- Supplemental sensor calibration requirements

### **2. Mission-Critical Deployments**

- Redundant system checks required
- Backup unit availability confirmation
- Enhanced monitoring protocols
- 24-hour response team standby

## **6. NON-COMPLIANCE CONSEQUENCES**

1. Any deviation from this Schedule must be documented and approved by the Chief Robotics Officer or authorized designee.

2. Failure to maintain compliance may result in:

- Immediate unit decommissioning
- Customer notification requirements
- Warranty invalidation
- Regulatory reporting obligations

## **7. SCHEDULE UPDATES AND REVISIONS**

1. This Schedule shall be reviewed and updated annually or upon:

- Introduction of new AMR models
- Significant technology updates
- Regulatory requirement changes
- Identification of new maintenance requirements

## **8. AUTHORIZATION**

This Preventive Maintenance Compliance Schedule is hereby adopted and approved:

POLAR DYNAMICS ROBOTICS, INC.

**By:**

Dr. James Barrett

Chief Robotics Officer

**Date:**

**By:**

Sarah Nordstrom

Chief Operating Officer

**Date:**

## **9. DOCUMENT CONTROL**

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