OPERATIONS DOCUMENT 399

STANDARD OPERATING PROCEDURES FOR AUTONOMOUS MOBILE ROBOT DEPLOYMENT AND MAINTENANCE

Effective Date: January 1, 2024

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1. PURPOSE AND SCOPE

1. This Operations Document ("Document") establishes binding operational procedures and protocols for the deployment, maintenance, and decommissioning of Polar Dynamics Robotics, Inc. ("Company") autonomous mobile robots ("AMRs") in temperature-controlled environments.

2. This Document applies to all Company personnel involved in AMR operations, including but not limited to field technicians, deployment specialists, maintenance engineers, and operational supervisors.

2. DEFINITIONS

1. "IceNav System" means the Company's proprietary cold-environment navigation and operation platform.

2. "Critical Operating Temperature" means any ambient temperature below -30 C (-22 F).

3. "Deployment Zone" means any customer facility where Company AMRs are installed and operational.

4. "Thermal Management Protocol" or "TMP" means the Company's standardized procedures for maintaining optimal AMR operating temperatures.

3. DEPLOYMENT PROCEDURES

1. Pre-Deployment Assessment

a) Conduct comprehensive site survey of Deployment Zone

b) Document all thermal zones and transition areas

c) Map facility layout using IceNav mapping protocols

d) Verify facility compliance with Company's Technical Specification 276-B

2. Installation Requirements

a) Calibrate thermal sensors according to Procedure Manual TD-892

b) Initialize IceNav System with zone-specific parameters

c) Conduct minimum 48-hour testing period in each thermal zone

d) Verify redundant safety systems functionality

4. MAINTENANCE PROTOCOLS

1. Scheduled Maintenance

a) Weekly diagnostic scans of thermal management systems

b) Monthly actuator performance assessments

c) Quarterly full-system calibration

d) Semi-annual IceNav System updates

2. Emergency Maintenance

a) Response time requirements:

- Critical failures: 2 hours
- Non-critical failures: 8 hours
- System warnings: 24 hours

b) Documentation requirements per Technical Bulletin 2023-14

5. SAFETY AND COMPLIANCE

1. All operations must comply with:

a) Company Safety Protocol SP-471

b) OSHA Standard 1910.184

c) ISO/TS 15066:2016

d) Customer-specific safety requirements

2. Required Safety Measures

a) Emergency stop system testing every 72 hours

b) Weekly safety zone verification

c) Monthly compliance audits

d) Quarterly safety training for all operational personnel

6. DOCUMENTATION AND REPORTING

1. Required Documentation

a) Daily operational logs

b) Maintenance records

c) Incident reports

d) Performance metrics

e) Temperature monitoring data

2. Reporting Schedule

a) Daily: Operational status reports

b) Weekly: Performance summaries

c) Monthly: Compliance verification

d) Quarterly: System health assessments

7. PROPRIETARY INFORMATION

1. All operational procedures, technical specifications, and maintenance protocols contained herein are confidential and proprietary to Polar Dynamics Robotics, Inc.

2. Disclosure of any information contained in this Document to unauthorized parties is strictly prohibited and may result in legal action.

8. AMENDMENTS AND UPDATES

1. This Document may be amended or updated by the Company at any time, with notice to relevant personnel.

2. All amendments must be approved by:

a) Chief Technology Officer

b) Chief Operations Officer

c) Chief Robotics Officer

9. EXECUTION AND ACKNOWLEDGMENT

The undersigned hereby acknowledges receipt and understanding of this Operations Document and agrees to comply with all procedures and protocols contained herein.

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[Name]

[Title]

Polar Dynamics Robotics, Inc.

**Date:**

Witness

**Date:**
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10. DOCUMENT CONTROL

Document Owner: Operations Department

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