OPERATIONS DOCUMENT 384

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 power infrastructure compatibility

e) Assess wireless communication coverage

2. Installation Requirements

a) AMR units must undergo 24-hour cold-soak testing

b) IceNav calibration must achieve 99.9% accuracy

c) Emergency stop systems verified at all critical points

d) Thermal sensors calibrated to 0.5 C accuracy

4. MAINTENANCE PROTOCOLS

1. Scheduled Maintenance

a) Weekly diagnostic scans of IceNav system

b) Monthly actuator performance verification

c) Quarterly thermal management system inspection

d) Semi-annual full system calibration

2. Preventative Maintenance

a) Daily automated self-diagnostic routines

b) Weekly thermal stress analysis

c) Monthly wear pattern analysis

d) Quarterly predictive failure analysis

5. SAFETY AND COMPLIANCE

1. All AMR operations must comply with:

a) ANSI/RIA R15.08-1-2020 safety requirements

b) ISO 10218-1:2011 robotics safety standards

c) Company's Cold Environment Safety Protocol

d) Customer-specific safety requirements

2. Emergency Procedures

a) Immediate shutdown protocol

b) Emergency extraction procedures

c) Incident reporting requirements

d) Customer notification protocol

6. QUALITY CONTROL

1. Performance Metrics

a) Navigation accuracy 99.5%

b) Thermal stability 2 C

c) Operating efficiency 95%

d) System uptime 98%

2. Documentation Requirements

a) Daily operation logs

b) Maintenance records

c) Incident reports

d) Performance analytics

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 the Chief Operations Officer and Chief Technology 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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POLAR DYNAMICS ROBOTICS, INC.

By: _

Name: Sarah Nordstrom

Title: Chief Operations Officer

Date: _

By: _

Name: Marcus Chen

Title: Chief Technology Officer

Date: _

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## 10. DOCUMENT CONTROL

Document Owner: Operations Department

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