OPERATIONS DOCUMENT 380

STANDARD OPERATING PROCEDURES FOR AUTONOMOUS MOBILE ROBOT DEPLOYMENT AND MAINTENANCE

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1. PURPOSE AND SCOPE

1. This Standard Operating Procedure ("SOP") document establishes the mandatory operational protocols for the deployment, maintenance, and decommissioning of Polar Dynamics Robotics, Inc. ("Company") autonomous mobile robots ("AMRs") in temperature-controlled environments.

2. This SOP applies to all Company personnel involved in AMR operations, including but not limited to field technicians, maintenance engineers, deployment specialists, 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 procedure for maintaining optimal AMR operating temperature in extreme cold environments.

3. PRE-DEPLOYMENT PROCEDURES

1. Site Assessment Requirements

a) Complete thermal mapping of deployment zone

b) Verification of floor surface conditions

c) RF interference testing

d) Emergency power systems evaluation

e) Network infrastructure assessment

2. Equipment Preparation

2.1. Each AMR unit must undergo:

a) Full diagnostic scan

b) Thermal resistance certification

c) IceNav calibration

d) Battery capacity verification

e) Actuator load testing

3. Documentation Requirements

3.1. Maintain records of:

a) Pre-deployment checklist completion

b) Site-specific risk assessment

c) Customer facility documentation

d) Emergency response protocols

e) Network security clearances

4. OPERATIONAL PROTOCOLS

1. Standard Operating Conditions

1.1. Monitor and maintain:

a) Operating temperature range (-40 C to +25 C)

b) Humidity levels (15% to 90% non-condensing)

c) Battery charge levels (minimum 20%)

d) Network connectivity strength

e) Obstacle detection systems

2. Emergency Procedures

2.1. Implement immediate shutdown if:

a) Temperature exceeds specifications

b) Navigation system failure occurs

c) Battery temperature anomaly detected

d) Collision avoidance system compromised

e) Communication loss exceeds 300 seconds

5. MAINTENANCE REQUIREMENTS

1. Scheduled Maintenance

1.1. Weekly Tasks:

a) Sensor cleaning and calibration

b) Battery performance analysis

c) Navigation system verification

d) Thermal management system inspection

e) Log file review and backup

2. Quarterly Service

2.1. Comprehensive evaluation of:

a) Actuator performance metrics

b) Thermal insulation integrity

c) Power system efficiency

d) Software version compliance

e) Safety system certification

6. COMPLIANCE AND REPORTING

1. All maintenance activities must be logged in the Company's central database within 24 hours of completion.

2. Incident reports must be filed within 4 hours of any operational anomaly.

3. Monthly performance reports shall be generated and reviewed by operational supervisors.

7. SAFETY AND LIABILITY

1. All personnel must maintain current safety certifications.

2. The Company shall not be liable for damages resulting from:

a) Unauthorized modifications to AMR units

b) Operation outside specified parameters

c) Failure to follow maintenance schedules

d) Improper facility preparation

e) Force majeure events

8. DOCUMENT CONTROL

1. This document is confidential and proprietary to Polar Dynamics Robotics, Inc.

2. Distribution limited to authorized personnel only.

3. Document must be reviewed and updated annually.

9. AUTHORIZATION

This document has been reviewed and approved by:

/s/ Sarah Nordstrom

Sarah Nordstrom

Chief Operating Officer

Polar Dynamics Robotics, Inc.

Date: January 1, 2024

/s/ Dr. James Barrett

Dr. James Barrett

Chief Robotics Officer

Polar Dynamics Robotics, Inc.

Date: January 1, 2024