OPERATIONS DOCUMENT 388

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. "Maintenance Protocol" means the prescribed series of inspection, service, and repair procedures detailed in Section 4.

3. DEPLOYMENT PROCEDURES

1. Pre-Deployment Assessment

a) Conduct comprehensive site survey including thermal mapping

b) Verify facility compliance with IceNav System requirements

c) Document all potential interference sources

d) Establish emergency shutdown protocols

2. Installation Requirements

a) Calibrate thermal management systems to facility specifications

b) Install and test redundant safety systems

c) Configure facility-specific navigation parameters

d) Verify communication infrastructure compatibility

3. Validation Testing

a) Execute minimum 72-hour continuous operation test

b) Validate performance across all operating temperatures

c) Document baseline performance metrics

d) Obtain customer sign-off on deployment checklist

4. MAINTENANCE PROTOCOLS

1. Scheduled Maintenance

a) Weekly system diagnostics

b) Monthly actuator performance validation

c) Quarterly thermal system inspection

d) Semi-annual navigation sensor calibration

2. Preventive Maintenance

a) Actuator lubrication replacement every 1,000 operating hours

b) Thermal barrier inspection every 500 operating hours

c) Battery system conditioning every 750 operating hours

d) Navigation sensor cleaning every 250 operating hours

3. Emergency Maintenance

a) 24/7 remote diagnostic capability required

b) Maximum 4-hour response time for critical failures

c) Maintenance log documentation requirements

d) Customer notification protocols

5. SAFETY AND COMPLIANCE

1. Safety Requirements

a) Maintain compliance with ANSI/RIA R15.06-2012

b) Adhere to facility-specific safety protocols

c) Implement emergency stop procedures

d) Maintain updated risk assessment documentation

2. Regulatory Compliance

a) FDA 21 CFR Part 11 compliance for pharmaceutical facilities

b) FSMA compliance for food storage facilities

c) OSHA workplace safety requirements

d) Local regulatory requirements as applicable

6. DOCUMENTATION AND REPORTING

1. Required Documentation

a) Deployment checklist and validation reports

b) Maintenance logs and service records

c) Incident reports and resolution documentation

d) Performance metrics and analytics

2. Reporting Requirements

a) Monthly performance reports to customer

b) Quarterly compliance audits

c) Annual safety certifications

d) Incident investigation reports within 48 hours

7. PROPRIETARY INFORMATION

1. All technical specifications, procedures, and protocols contained within this Document are confidential and proprietary to Polar Dynamics Robotics, Inc.

2. Disclosure of any information contained herein 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 Technology Officer and Chief Operations Officer.

9. EXECUTION

IN WITNESS WHEREOF, this Operations Document has been executed by the duly authorized representatives of Polar Dynamics Robotics, Inc.

By:

Name: Sarah Nordstrom

Title: Chief Operations Officer

Date: January 1, 2024

By:

Name: Dr. James Barrett

Title: Chief Robotics Officer

Date: January 1, 2024