# OPERATIONS DOCUMENT 368

## STANDARD OPERATING PROCEDURES FOR AUTONOMOUS MOBILE ROBOT DEPLOYMENT AND MAINTENANCE

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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 including thermal mapping

b) Verify facility compliance with Company's Technical Specification Document 275

c) Document all thermal transition zones and temperature gradients

d) Validate IceNav System compatibility with facility layout

2. Installation Requirements

a) Follow Company's Cold Environment Installation Protocol (CEIP-2023)

b) Calibrate thermal sensors according to Specification Sheet 147

c) Install redundant emergency shutdown systems

d) Verify charging station thermal management systems

## 4. MAINTENANCE PROTOCOLS

1. Scheduled Maintenance

a) Perform weekly diagnostic scans of IceNav System

b) Conduct monthly actuator performance assessments

c) Execute quarterly thermal management system calibration

d) Document all maintenance activities in Company's secure cloud platform

2. Emergency Maintenance

a) Response time requirements:

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

b) Follow Emergency Response Protocol 92 for thermal-related failures

## 5. SAFETY AND COMPLIANCE

1. Safety Requirements

a) Maintain minimum clearance zones per Safety Document 183

b) Monitor thermal stress indicators continuously

c) Implement automatic shutdown procedures when temperature exceeds specifications

d) Conduct monthly safety audits

2. Regulatory Compliance

a) Maintain documentation required by 29 CFR 1910.184

b) Ensure compliance with ISO/TS 15066:2016

c) Update safety protocols as required by applicable regulations

## 6. QUALITY CONTROL

1. Performance Metrics

a) Monitor and document:

- Navigation accuracy in sub-zero environments
- Battery performance at Critical Operating Temperatures
- Thermal management system efficiency
- Emergency shutdown system response times

2. Quality Assurance

a) Conduct weekly performance reviews

b) Maintain calibration records

c) Document all system modifications

d) Perform quarterly audit of maintenance records

## 7. DECOMMISSIONING PROCEDURES

1. AMR decommissioning shall follow Company's Environmental Compliance Protocol 47

2. All proprietary components must be removed and returned to Company

## 8. CONFIDENTIALITY

1. This Document contains confidential and proprietary information of Polar Dynamics Robotics, Inc.

2. Unauthorized disclosure, copying, or distribution is strictly prohibited.

## 9. AMENDMENTS AND UPDATES

1. This Document may be amended only by written authorization from the Company's Chief Technology Officer or Chief Operations Officer.

2. All amendments must be documented in the Company's change management system.

## APPROVAL AND EXECUTION

APPROVED AND ADOPTED this 1st day of January, 2024.

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