

PDR-OPS-015: MATERIAL HANDLING IN SUB-ZERO ENVIRONMENTS

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Effective Date: January 15, 2024

Document Version: 3.1

Classification: Confidential - Operations

Document Owner: Operations Department

1. PURPOSE AND SCOPE

1. This Standard Operating Procedure ("SOP") establishes mandatory

2. This document applies to all Company personnel, contractors, and

2. DEFINITIONS

1. "Sub-Zero Environment" means any controlled space maintained a
2. "Material Handling Equipment" or "MHE" includes all BlueCore(TM)
3. "Critical Components" refers to load-bearing mechanisms, battery s
4. "Safety Zone" means designated areas maintained at temperatures

3. SAFETY REQUIREMENTS

1. Personnel Requirements
 - a) All operators must complete Company-certified cold environment tr

- b) Mandatory use of Company-approved cold weather PPE
- c) Strict adherence to maximum exposure time limits
- d) Minimum two-person operation protocol during sub-zero operations

2. Equipment Requirements

- a) Pre-operation verification of BlueCore(TM) system status
- b) Confirmation of cold-weather lubricants in all mechanical systems
- c) Battery charge levels minimum 80% before sub-zero deployment
- d) Verification of emergency stop system functionality

4. OPERATIONAL PROCEDURES

1. Pre-Operation Protocol

- a) Equipment acclimation period: minimum 30 minutes

- b) System diagnostics check via BlueCore(TM) Control Panel
- c) Verification of wireless communication systems
- d) Load capacity confirmation for cold conditions

2. Active Operation Requirements

- a) Continuous monitoring of AMR performance metrics
- b) Regular inspection of load securing mechanisms
- c) Adherence to reduced speed protocols in sub-zero zones
- d) Maintenance of minimum 2-meter separation between units

3. Emergency Procedures

- a) Immediate reporting of any system warnings
- b) Emergency stop protocol implementation
- c) Personnel evacuation procedures

- d) Equipment recovery procedures

5. MAINTENANCE AND INSPECTION

1. Scheduled Maintenance

- a) Daily visual inspection of critical components
- b) Weekly comprehensive system diagnostics
- c) Monthly cold-weather performance validation
- d) Quarterly full system overhaul

2. Documentation Requirements

- a) Maintenance log completion after each shift
- b) Incident reporting within 24 hours
- c) Performance metric tracking

- d) Equipment certification records

6. COMPLIANCE AND ACCOUNTABILITY

1. All operations must comply with:

- a) OSHA cold storage workplace requirements
- b) Company safety protocols
- c) Client facility regulations
- d) Local regulatory requirements

2. Non-compliance may result in:

- a) Immediate operation suspension
- b) Mandatory retraining
- c) Disciplinary action

d) Contract review/termination

7. PROPRIETARY INFORMATION

1. This document contains confidential and proprietary information of

8. DOCUMENT CONTROL

1. Review Frequency: Annual
2. Last Review Date: January 15, 2024
3. Next Review Date: January 15, 2025
4. Document Owner: Director of Operations

9. APPROVAL AND AUTHORIZATION

APPROVED AND AUTHORIZED:

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Date: _

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Polar Dynamics Robotics, Inc.

Date: _

10. REVISION HISTORY

Version 3.1 - January 15, 2024

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Updated safety protocols for new BlueCore(TM) 3.0 platform

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Added emergency recovery procedures

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Revised maintenance schedules

Version 3.0 - July 1, 2023

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Major revision incorporating client feedback

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Enhanced cold weather specifications

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Updated compliance requirements

Version 2.1 - January 15, 2023

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Initial release of standardized protocol

