

ROBOT-HUMAN INTERACTION SAFETY GUIDELINES

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Polar Dynamics Robotics, Inc.

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Document Version: 2.4

Internal Reference: PDR-RHSG-2024-01

1. PURPOSE AND SCOPE

1. These Robot-Human Interaction Safety Guidelines (the "Guidelines")

2. These Guidelines apply to all PDR employees, contractors, customers, and visitors.

2. DEFINITIONS

1. "Interaction Zone" means any area within 3 meters of an operational PDR.
2. "Safety Override Protocol" means the emergency stop procedure and associated safety measures.
3. "Cold Environment Operations" refers to any environment where ambient temperature is below 10°C (50°F).
4. "Qualified Personnel" means individuals who have completed PDR's Safety Certification Program.

3. GENERAL SAFETY REQUIREMENTS

1. Certification Requirements
 - a) All personnel must complete PDR's Safety Certification Program before operating the PDR.

entering AMR operational areas

- b) Certification must be renewed annually
- c) Additional certification required for Cold Environment Operations

2. Personal Protective Equipment

- a) High-visibility clothing meeting ANSI/ISEA 107-2020 standards
- b) Cold environment protective gear when applicable
- c) Safety-toe footwear meeting ASTM F2413-18 requirements

4. OPERATIONAL PROTOCOLS

1. Pre-Operation Checks

- a) Visual inspection of AMR safety systems
- b) Verification of emergency stop functionality

- c) Communication system check
- d) Environmental condition assessment

2. Interaction Zone Protocols

- a) Maintain minimum 1.5-meter clearance when possible
- b) No unauthorized modifications to AMR programming
- c) Adherence to marked safety zones and pathways
- d) Immediate reporting of any irregular AMR behavior

5. COLD ENVIRONMENT SPECIFIC PROCEDURES

1. Additional Safety Measures

- a) Maximum exposure times as per OSHA cold stress guidelines
- b) Buddy system requirement for all cold environment interactions

- c) Regular temperature monitoring and logging
- d) Enhanced PPE requirements for sub-zero environments

2. Emergency Procedures

- a) Cold environment evacuation protocols
- b) Frost-related malfunction response procedures
- c) Emergency communication protocols
- d) Medical emergency response procedures

6. INCIDENT REPORTING AND INVESTIGATION

- 1. All safety incidents must be reported within 24 hours to:
 - a) Immediate supervisor
 - b) Safety Compliance Officer

c) Risk Management Department

2. Investigation Requirements

a) Root cause analysis

b) Corrective action planning

c) Documentation and record-keeping

d) Follow-up verification

7. COMPLIANCE AND ENFORCEMENT

1. Compliance Monitoring

a) Regular safety audits

b) Performance metrics tracking

c) Quarterly compliance reviews

d) Annual program evaluation

2. Enforcement

- a) Progressive disciplinary actions for violations
- b) Immediate suspension of access for serious violations
- c) Mandatory retraining requirements
- d) Documentation of all enforcement actions

8. LEGAL DISCLAIMERS AND LIMITATIONS

- 1. These Guidelines do not create any contractual rights or obligations
- 2. PDR reserves the right to modify these Guidelines at any time without notice
- 3. Compliance with these Guidelines does not guarantee safety or prevent injury

9. ACKNOWLEDGMENT AND ACCEPTANCE

The undersigned acknowledges receipt and understanding of these G
agrees to comply with all requirements contained herein.

...

Name: _

Title: _

Date: _

Signature: _

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10. DOCUMENT CONTROL

Version History:

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2.4: January 15, 2024 - Updated cold environment protocols

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2.3: July 1, 2023 - Added new PPE requirements

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2.2: January 15, 2023 - Updated certification requirements

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2.1: July 1, 2022 - Initial release

Approved by:

Dr. Elena Frost, CEO

Dr. James Barrett, Chief Robotics Officer

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Document Owner: Safety Compliance Department

Next Review Date: July 15, 2024

