

COLD STORAGE FACILITY SAFETY AUDIT REPORT

Polar Dynamics Robotics, Inc.

Facility: PDR-East Manufacturing & Testing Center

Location: 2850 Innovation Drive, Newark, DE 19713

Audit Date: January 8-9, 2024

Report Date: January 11, 2024

Document Reference: SAR-2024-001

1. EXECUTIVE SUMMARY

This safety audit report documents the comprehensive evaluation of Polar Dynamics Robotics, Inc.'s ("PDR") cold storage testing facility, where the company's autonomous mobile robots (AMRs) undergo extreme condition testing and validation. The audit was conducted in accordance with OSHA standards, ANSI/RIA R15.06-2012 guidelines for industrial robots, and internal safety protocols.

1.1 Audit Scope

- Cold storage testing chambers (Zones A-D)
- Robot staging and preparation areas
- Emergency response systems
- Personnel safety protocols
- Environmental control systems
- Hazardous material storage and handling

1.2 Key Findings

- Overall Compliance Rating: 94/100
- Critical Safety Issues Identified: 0
- Non-Critical Findings Requiring Action: 3
- Improvement Recommendations: 5

2. FACILITY SPECIFICATIONS

2.1 Physical Infrastructure

- Total Facility Area: 45,000 sq ft

- Cold Storage Testing Zones: 4
- Temperature Range Capability: +25 C to -40 C
- Maximum Robot Capacity: 12 units simultaneously
- Emergency Exits: 8
- Fire Suppression Systems: Dual-agent (water/chemical)

2.2 Environmental Controls

- Primary Cooling System: Industrial ammonia refrigeration
- Backup System: Redundant compression units
- Temperature Monitoring: Digital sensors with 0.1 C accuracy
- Humidity Control: 15-85% RH capability
- Air Quality Monitoring: CO2, O2, and particulate matter

3. SAFETY SYSTEMS ASSESSMENT

3.1 Emergency Response Infrastructure

- Emergency Stop Systems: Compliant
- Lock-Out/Tag-Out Procedures: Compliant
- Emergency Communication System: Compliant
- Evacuation Routes: Compliant
- First Aid Stations: Compliant
- Emergency Lighting: Compliant

3.2 Personal Protective Equipment (PPE)

- Cold Environment Suits: Available and maintained
- Respiratory Protection: Available and maintained
- Safety Goggles: Available and maintained
- Thermal Gloves: Available and maintained
- Safety Footwear: Available and maintained

4. OPERATIONAL SAFETY PROTOCOLS

4.1 Personnel Safety Procedures

- Entry/Exit Protocols: Documented and enforced

- Buddy System Requirements: Implemented
- Time Limits in Cold Zones: Monitored and enforced
- Rest Periods: Scheduled and tracked
- Health Monitoring: Regular checks implemented

4.2 Robot Testing Safety Protocols

- Pre-Test Safety Checks: Documented
- Operation Boundaries: Clearly marked
- Human-Robot Interaction Guidelines: Enforced
- Emergency Shutdown Procedures: Tested monthly
- Test Area Access Control: Badge-restricted

5. COMPLIANCE ASSESSMENT

5.1 Regulatory Compliance

- OSHA 29 CFR 1910.176: Compliant
- ANSI/RIA R15.06-2012: Compliant
- ISO 10218-2:2011: Compliant
- NFPA 70E: Compliant
- State Industrial Safety Regulations: Compliant

5.2 Internal Policy Compliance

- Safety Training Program: Current
- Documentation Requirements: Met
- Incident Reporting System: Active
- Safety Committee Meetings: Regular
- Annual Review Process: Implemented

6. IDENTIFIED ISSUES AND RECOMMENDATIONS

6.1 Non-Critical Findings

Temperature monitoring display in Zone C showing delayed updates (15-second lag)

- Recommendation: Replace sensor unit within 30 days

Secondary emergency lighting system battery backup showing reduced capacity

- Recommendation: Replace batteries in affected units within 14 days

Incomplete documentation for maintenance checks in December 2023

- Recommendation: Update records and implement digital tracking system

6.2 Improvement Recommendations

Install additional temperature monitoring displays at robot staging areas

Upgrade emergency communication system to include visual alerts

Implement automated PPE tracking system

Enhance ventilation in Zone D preparation area

Update safety training materials to include new robot models

7. ACTION PLAN AND TIMELINE

7.1 Immediate Actions (0-30 days)

- Replace Zone C temperature monitoring sensor
- Replace emergency lighting backup batteries
- Complete missing maintenance documentation
- Update safety training materials

7.2 Short-Term Actions (31-90 days)

- Install additional temperature displays
- Upgrade emergency communication system
- Implement automated PPE tracking

7.3 Long-Term Actions (91-180 days)

- Enhance Zone D ventilation
- Conduct comprehensive safety protocol review
- Update facility safety manual

8. CERTIFICATION

This safety audit was conducted in accordance with all applicable regulations and standards. The findings and recommendations contained herein represent a thorough evaluation of the facility's

safety systems and protocols.

Audit Conducted By:

- Lead Auditor: Sarah Martinez, CSP
- Technical Specialist: Dr. Robert Chen, P.E.
- Safety Committee Representative: James Wilson

Approved By:

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Chief Financial Officer

Polar Dynamics Robotics, Inc.

Sarah Nordstrom

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Polar Dynamics Robotics, Inc.

Date: January 11, 2024

9. LEGAL DISCLAIMER

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