

Effective Management of Ammonia

WorkSafeBC

Municipal Safety Association

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Overview

- Findings from Fernie incident investigation
- WorkSafeBC's three-phase inspection initiative
- Employer responsibilities



Fernie Memorial Arena Incident

As the regulator for occupational health and safety in B.C., WorkSafeBC is mandated by legislation to investigate workplace incidents. The primary purpose of WorkSafeBC's incident investigation reports is to identify the cause of the incident, including contributing factors, so that similar incidents can be prevented from happening in the future.

Findings of Fernie Investigation

Cause

- Hole that allowed mixing of brine and ammonia
- Compromised refrigeration equipment failed when put into service
- Issue of high ammonia concentrations in brine system was not addressed by employer or contractor



Findings of Fernie Investigation

Contributing factors

- Health and safety systems did not mitigate risks to workers
 - Inspections and incident investigations not conducted – did not detect and correct initial leak 6 months before
 - Important information not communicated
 - Contingency and action plans not developed
- Contractor
 - Key safe work procedures not used as intended

Findings of Fernie Investigation

Contributing factors

- Incident response measures were not present
 - No interim measures in place during maintenance
 - Firefighters had been dismissed and alarm system disabled prior to loss of containment so no mechanism in place to alert about serious incident
 - Workers in room not wearing adequate PPE
 - No rescue team standing by
- Manufacturing process fostered preferential corrosion
 - Allowed unwanted substance, making certain areas susceptible to higher than average corrosion

Ammonia Inspection Initiative

Overview

In November 2017, we launched a three-phase inspection initiative focusing on exposure control plans and emergency response

- **Phase 1 (Q4 2017)** – Public and private ice arenas using ammonia throughout the province
- **Phase 2 (Initiated Q1 2018)** – Contractors conducting installations, maintenance, and other activities on ammonia systems
- **Phase 3 (Launch Q4 2018)** – Other employers using or storing ammonia

Ammonia Inspection Initiative

Phase 1 findings

- 181 inspections carried out in all ammonia-charged arenas in B.C.
- 1,108 orders issued
- 83% compliance rate achieved so far

Ensuring sustained compliance – Revisiting municipalities

- Review order compliance acknowledging the work done
- Work with sites having challenges
- Review investigation findings with joint health and safety committees and senior leadership

Ammonia Inspection Initiative

Phase 2 findings

- 31 inspections carried out on refrigeration contractors conducting installations, maintenance, and other activities on ammonia systems
- Top 2 orders – ECP and emergency plans

Ensuring sustained compliance – Follow up

- Review order compliance
- Acknowledge the work done
- Review investigation findings

Ammonia Inspection Initiative

Phase 3

- Focused on industry sectors that use large quantities of ammonia at their sites
- Starting with fish processing plants
- Coordination with Technical Safety BC

Employer responsibilities

- Role of the site owner
- Role of the prime contractor
- Workplace inspections
- Personal safety of workers



Employer responsibilities

- Exposure control plans
- Personal protective equipment
- Emergency procedures
- Equipment requirements



What can you do?

- Understand the hazards in your workplace
- Include safety and risk management as part of your decision making — especially in procurement and change-management decisions
- Inspect and assess the safe operating condition of critical infrastructure
- Be aware of the age and lifecycle of critical infrastructure, and plan for its replacement
- Assess the risks of running equipment to failure
- Most importantly → Action your plan

Questions?