

# Canadian Experiences

with

# Refuge Stations

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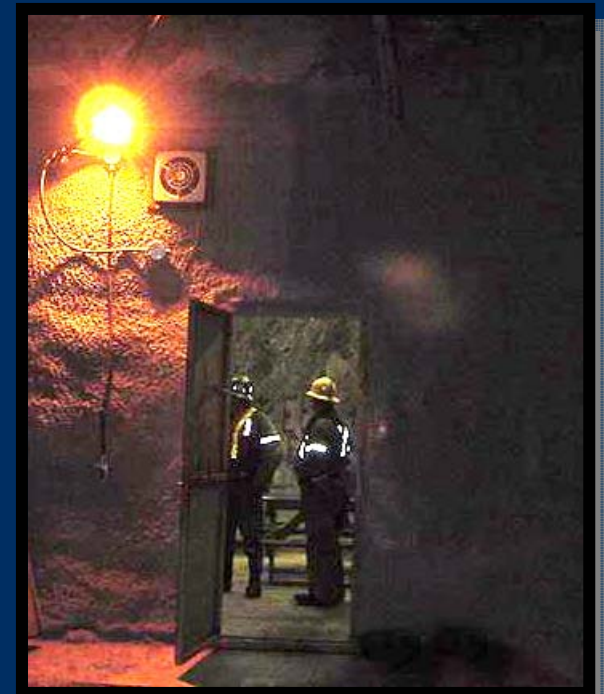
Manager of Mine Rescue



Mines and Aggregates  
Safety and Health  
Association

# Lessons Learned

- 1928 Hollinger mine fire
- 39 miners lost their lives
- refuge stations first established





# Legislated Requirements

## Section 26

Where the procedure in case of a fire in an underground mine provides for the use of refuge station for workers, the refuge station shall;

- (a) Be constructed with materials having at least a one-hour fire-resistance rating;
- (b) Be of sufficient size to accommodate the workers to be assembled therein;
- (c) Be capable of being sealed to prevent the entry of gases;
- (d) Have a means of voice communication with the surface; and
- (e) Be equipped with a means for the supply of,
  - (a) Compressed air, and
  - (b) Potable water.



# Refuge Station Equipment, Furnishings and Supplies

- Air line
- Potable water
- Fire/sealing clay
- Communication system
- Lighting
- Seating
- Emergency equipment
- Miscellaneous supplies





# Types of Refuge Station at Ontario Mines

- Permanent with compressed airlines.
- Permanent with RANA (Rimer Alco North America) System.
- Portable stations with cascade air cylinders.



# Idealized Schematic Single Door Refuge Station



# Idealized Schematic Double Door Refuge Station





# Sequence of Refuge Station

Underground refuge station outside entrance  
– steel door and cement wall, p-trap through  
wall and floor



**Underground refuge station – inside of door way, hot water tank on right, sink and potable water on left**





# Underground refuge station – inside facilities: food warming oven, microwave, fridge, potable water fountain, sink





# Underground refuge station notice board containing diesel ventilation charts and fire orders for level



**Underground refuge station- stretcher box, eyewash station and emergency list of occupants (name, badge #, supervisor)**





# Underground refuge station – telephone list for all of mine, telephone





**Underground refuge station  
fire clay in pails. Used to seal  
doorway.**



**Underground refuge station air and water lines plumbed inside refuge station. Air line is plumbed with silencer and cracked open to allow stench to reach occupants at any time.**





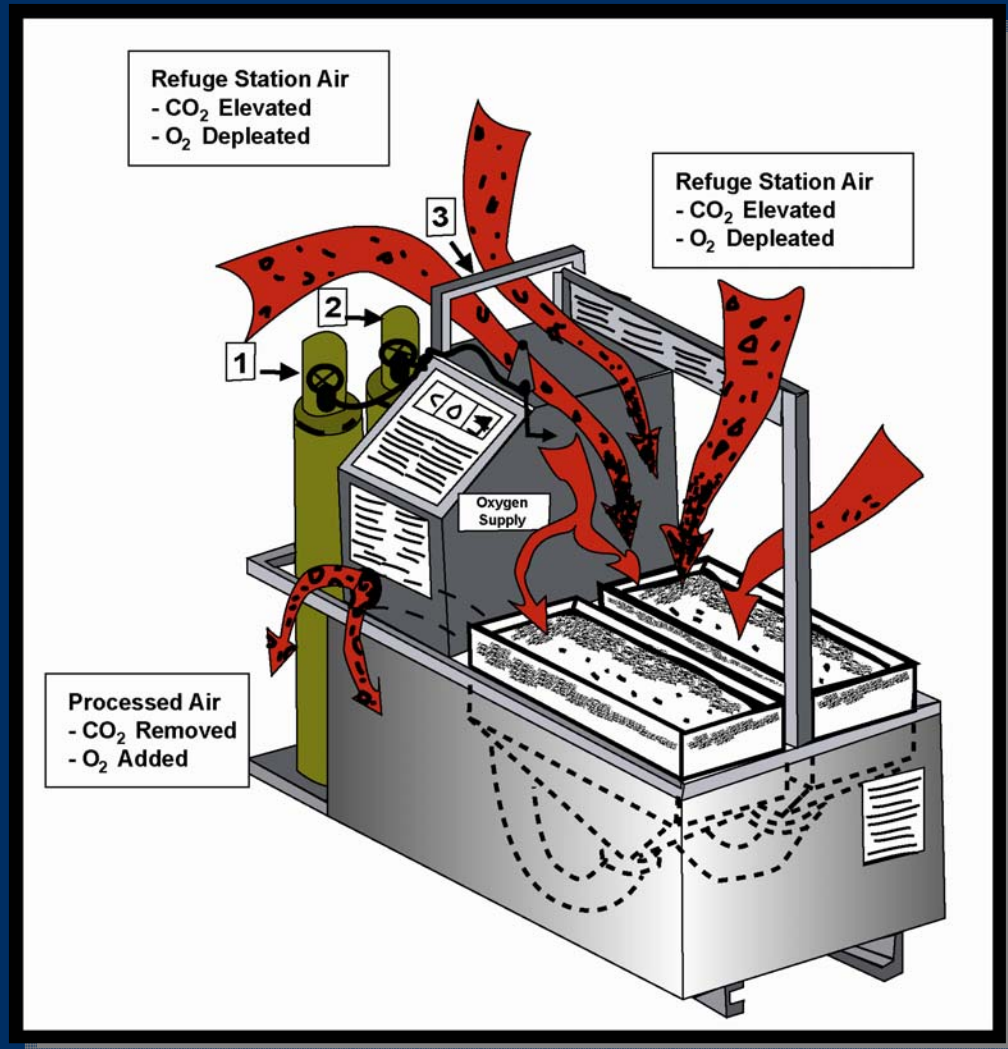
# Underground refuge station showing tables and benches for occupants



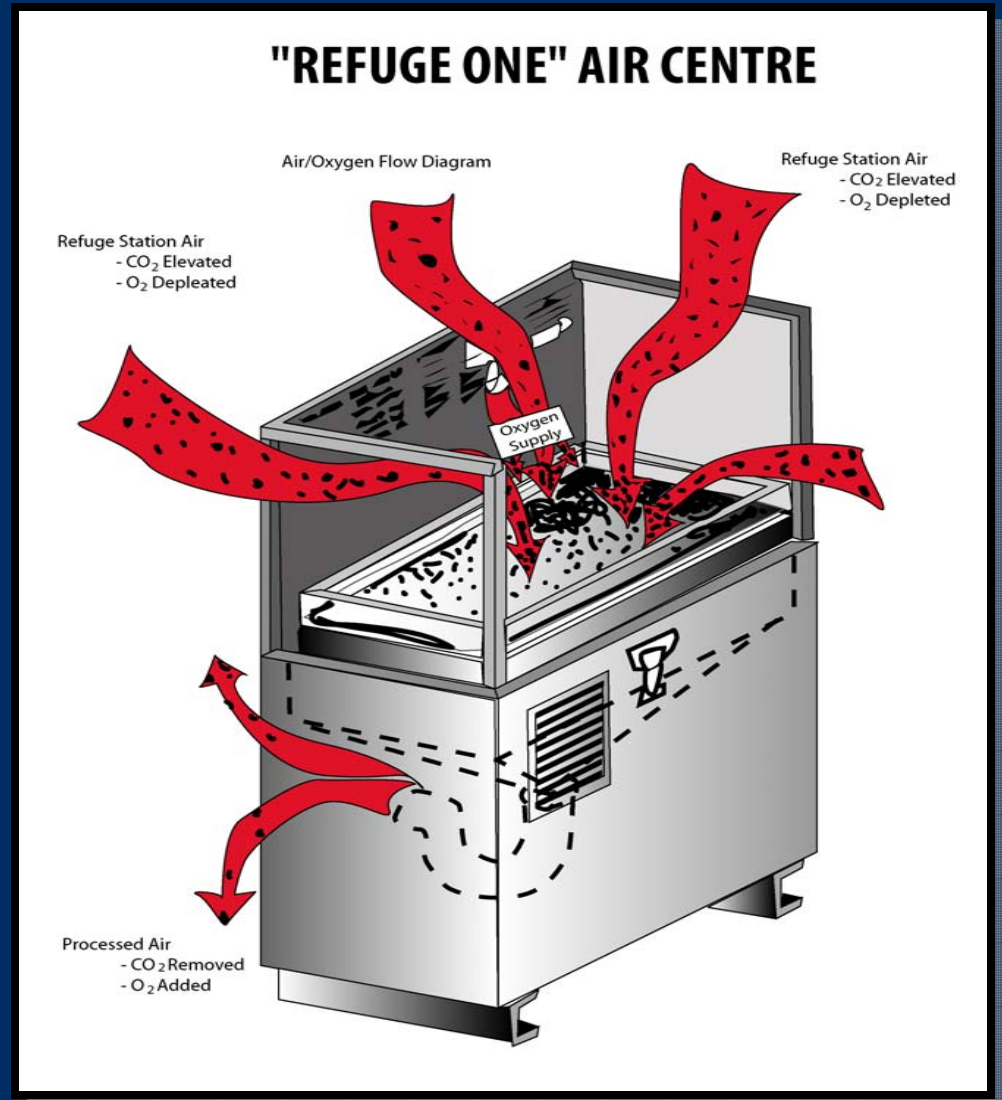




# Refuge One System Diagram



# Refuge One System Diagram





# Refuge Station Procedures

- Person to take control
- If air line available, crack header lightly
- If using bottled air use sparingly
- Record names of personnel
- Follow site emergency procedures



# Conclusions

- Need to establish a mine emergency preparedness plan.
- Train workers in proper procedures.
- Evaluate the system and procedures by conducting audits, drills and simulations.
- Modify the plan to accommodate changes in technology and as mining advances.





**Thank you**

**ANY QUESTIONS?**

