Millennium
Cryogenic Technologies

In 2018 a fatal incident occurred in our facility due to workers entering an oxygen-depleted confined space which was a result of breakdowns in our Safety Management System. What took place will forever change our lives, as well as our workers and their families who were employed with us at that time.

Our company has implemented many preventative measures to ensure an incident of this nature could never occur again. Here are a few things that we learned from this incident:

⇒ Safety starts with us, as Owners, and the importance of buy in for safety from all levels of workers is essential.

⇒ Prevention is achieved by a combination of policy, safe work procedures and compliance with those procedures.

Background
It was a typical workday for our workers which required them to conduct a second nitrogen cooling cycle later in the day. The morning started with workers reviewing the tasks that would take place. Workers onsite included two experienced employees, one Lead Hand and one inexperienced worker. Workers started by conducting monitoring of the cryogenic tank - as required – continued to remove the two spools from Cryo Box B, which had gone as planned. Later on, the second nitrogen cooling cycle in Box A was set to begin. The position of the blast gates was not properly configured in accordance with Box A running instead of Box B to stop the flow of nitrogen from entering Box B. This is where workers would be completing their task later that day. The exit gate was left closed instead of venting as well.

What took place:
- Blast gate was not manually closed.
- No confined space permit was completed.
- O2 levels in the box were not tested prior to entry.
- Employees were not wearing personal O2 monitors.
- Employees did not have confined space training.
- No attempt to don the rescue rig by second or third employees.
- Loader operator left the loader (against policy) and failed to call 911.

What should have happened after lunch and before the tank was opened:
- Confined space entry permit should have been completed, prompting the steps of the confined space protocol (checking for O2 levels, prep of the Scott pack).
- Blast gate should have been manually checked and verified to prevent the flow of nitrogen into Box B.
- A worker trained in confined space rescue should have been included in the task to lookout and be ready to don the SCBA if needed.
- Personal O2 monitors should have been worn by all personnel at all times.
- Oxygen levels in the box should have been tested twice prior to entry.

- Confined space entry personnel should have been wearing the rescue harness to facilitate rescue.

Identified causes of this incident were:

- Procedure for the task (unloading Box B) was written down but not posted or made easily available to workers.
- No exercises had been conducted/practiced for the rescue procedure.
- Failure to wear O2 monitors and test oxygen levels in the box.
- Failure to ensure no one enters confined space without an observer or alone.
- Complacency – this procedure had been completed numerous times by workers, including that very morning, which lead to over confidence and oversight of possible consequences.
- Lack of a formal Health and Safety Management System with full hazard identification and control training.

The consequences of these events include:

- Three deaths.
- Stop work order from Alberta OH&S.
- Criminal prosecution.
- Massive fine.
- Emotional/mental distress of all associated with the accident.
- Loss of industry reputation.

Through teamwork with our staff and Occupational Health and Safety professionals' guidance and expertise, proper processes and procedures have been implemented, and training gained to support confined space entry and rescue.

Engineered hazard controls have been implemented. Complete automation for the cryo boxes was installed to alert for a low oxygen environment. We upgraded and installed a ventilation system to help purge the building of nitrogen in the event of a leak and all personnel are required to wear oxygen monitors.

Administrative hazard controls were updated to include inspections of all systems, and maintenance plans and procedures were put in place.

We also recognized training gaps for our workers within our system, which included confined space entry and rescue, WHMIS, loader and forklift operation. Identified training was provided to all workers. Formalized emergency response plans were created and posted throughout the facility which include the confined space entry program.

Monthly rescue drills were, and continue to be, implemented which include donning of rescue harnesses and SCBA units to increase the likelihood that it will be remembered in the event of an emergency.

Policies and procedures were written and made available to all employees. A full orientation program was overhauled to ensure all personnel understand the hazards of the tasks and work being conducted.

In addition, a health and safety representative (HSR) were put in place and received extensive training through an OHS recognized certifying partner for their HSR responsibilities.

As owners of MCT, we recognize the importance of safety in the workplace and constantly remind our employees of its importance. We know we have a commitment to protect our employee's health and safety and to ensure they go home to their loved ones at the end of the day. Through extensive changes to our company, which includes the importance of buy in for safety from all levels of employees, we continue to learn from this tragic event. We have not only changed our company's way of thinking, but maybe for yours as well.