

# Chiller Condenser Replacement

## CLIENT

Defence Construction  
Canada, Defence Research &  
Development Canada

## LOCATION

Toronto, Ontario

## Project Description

Defence Research & Development Canada (DRDC) in Toronto has been a Facilities Management and Operations client with Black & McDonald for several years. Located within its facility is a chiller that services DRDC's dive chamber, which is used to simulate various dive conditions for the Royal Canadian Navy among other agencies around the world. The role of the chiller is to provide extreme water temperatures to simulate anything from Arctic to Caribbean water conditions.

The present chiller utilizes a water cooled condenser that ran city water in and out of the condenser to convert high pressure and temperature refrigerant vapour to a low pressure and temperature liquid refrigerant. The chiller and condenser were 40-years-old and had been producing high maintenance and service costs and wasting water. Hence, DRDC needed to convert the current water cooled condenser to a more modern and efficient air cooled condenser. Additional work was needed to convert the banned R22 refrigerant to the more ozone friendly R407C refrigerant.

The project would also require new refrigerant piping from the indoor chiller to the new air cooled condenser outside the building. Each compressor also needed oil to be changed, conduct a leak check, and pressure test the system and charge with the new refrigerant.

# Chiller Condenser Replacement

## B&M Scope of Work

This project required a scope of work including:

- Recovering R22 refrigerant from the chiller
- Remove the existing water cooled condensers and dispose of them
- Run new refrigerant piping, accessories and insulation to new air cooled condenser located to the exterior of the building 50 feet from the indoor chiller
- Install a new exterior concrete pad to accommodate the new condenser
- Pressure test the new piping system using dry nitrogen and repair leaks due to poor brazed joints, leaky gaskets defective accessories
- Ensure TSSA performs its final piping inspection
- Evacuate piping system using vacuum pumps, charge the system using new R407C refrigerant and commission the chiller, ensuring that it is operating within design parameters

## Benefits to Client or Problem(s) Solved

As a result of the professional and innovative work of Black & McDonald's professionals, DRDC achieved cost savings from water conservation, energy savings by using a more efficient condenser by ratio, and the environmental benefit of the removal of the banned R22 refrigerant from the system.