



# DRDC Chiller Condenser Replacement

## CLIENT

Defence Research & Development  
Canada (DRDC)

## LOCATION

Toronto, Ontario

## PROJECT DESCRIPTION

Defence Research & Development Canada (DRDC) in Toronto has been a facilities management and operations client with Black & McDonald (B&M) 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 and 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 old chiller utilized 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 also required 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.



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## B&M SCOPE OF WORK

The scope of work included:

- Recovering R22 refrigerant from the chiller
- Removing existing water cooled condensers and disposing them
- Running new refrigerant piping, accessories and insulation to new air cooled condenser located to the exterior of the building 50 feet from the indoor chiller
- Installing a new exterior concrete pad to accommodate the new condenser
- Pressure the new piping system using dry nitrogen and repairing leaks due to poorly brazed joints, leaky gaskets and defective accessories
- Ensuring TSSA performed its final piping inspection
- Evacuating the piping system using vacuum pumps, charging the system using new R407C refrigerant and commission the chiller, and ensuring that it operated 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.