

2022 Annual Report – Transmit Array Antenna Farm

In September 2022, the project team made its first visit to Eureka in three years. The COVID-19 pandemic caused the Eureka Weather Station to close to visitors in March 2022, which has prevented the project team from doing visits to Eureka. While the Eureka Weather Station continues to be closed to visitors, the project team has been able to negotiate with the Royal Canadian Air Force to use seasonal buildings at the Eureka Airport, referred to as Fort Eureka. Fort Eureka is normally used by military members supporting the annual Operation Nevus to maintain the High Arctic Data Communications System (HADCS). The Operation Nevus team had finished using the Fort Eureka buildings in August 2022 and had departed Eureka by the time the project team arrived. The project team entered Fort Eureka in September 2022 and stayed for a total of 10 days in the unoccupied building.

During its time at Eureka, the project team attempted to operate the Transmit Array Antenna Farm. The antenna farm consists of 256 monopole antennas, each 9 meters tall, arranged in a 16-by-16 square lattice that measures 120 meters on a side. A 256 kilowatt transmitter is planned for running the Transmit Array Antenna Farm at full power, consisting of 1 kilowatt per monopole antenna. The 256 kilowatt transmitter has had technical problems, however, and the contractor is still trying to deliver this transmitter for factory acceptance testing. In the meantime, a 20-foot electronics shelter has been placed at site containing a smaller 32 kilowatt transmitter provided by a partner organization, which will allow the project team to run the antenna array at a reduced power level. During the September 2022 visit, the 32 kilowatt transmitter was installed and turned on by the Eureka project team, but it quickly became clear that there was a leak in the transmitter coolant circuit. The project team spent considerable effort in the days following the discovery of the leak to repair the leak using available equipment and material, but without success.

Thus the project team eventually gave up on operating the Transmit Array Antenna Farm and went home. A plan is being formulated to send in a repair crew in May or June 2023 to repair the coolant leak and provide another opportunity to run the Transmit Array Antenna Farm.

If the May or June 2023 repairs to the 32 kilowatt transmitter coolant system are successful, then the Transmit Array Antenna Farm would operate at 32 kilowatt power level in the June timeframe. In the meantime, a contractor will try to move the four shelters for the 256 kilowatt transmitter to their new position. If the factory acceptance tests for the 256 kilowatt transmitter are also successful, then the project will ship the 256 kilowatt transmitter to the Eureka Weather Station and the project team would attempt to run it in the September 2023 time frame. If the factory acceptance for the 256 kilowatt system is not successful, then the project team will continue to use the 32 kilowatt transmitter that is already at Eureka.