

## Jämtkraft – Fault detection at sporting event

**Participants:** Jämtkraft, AddSecure

**Category:** Wide-area monitoring and control

**Time plan:** Installed before the 2019 Biathlon World Championships

**Contact person:** Benny Karlsson, Jämtkraft

**Location:** Östersund

**Possible to visit:** Yes

### Background

In March 2019 the Biathlon World Championship was held in Östersund, which demanded uninterrupted electricity for the television broadcast to be seamless. There are back-up UPS's that are able to handle a power outage for 10 minutes, but after that there needs to be a different mean of energy supply. This back-up is usually provided by diesel units, that can be used if there is an electricity service interruption. Östersund however, wanted to run the world championships in an eco-friendly manner and therefore opted for a solution where the grid is monitored in real time to provide fault detection and location of the fault. This would allow Jämtkraft to take action to isolate the fault and restart the system within the allotted ten minutes.

### Implementation of the project

Jämtkraft installed sensors from Addsecure in several substations on the 20 kV loop that feeds power to the Biathlon arena. The sensors detect overcurrents and ground faults and alert the grid operator about the type of fault and its location. This makes it possible to isolate the fault and restart the system within ten minutes, and make sure that the electricity distribution is not interrupted for too long.

As the system uses the GSM network for communication, Jämtkraft also wanted to test the system when there is a heavy load on the mobile network, as was the case during the championships. The fault detection system was never needed during the championship, as there were no faults in the power grid. However, it has been tested in a realistic situation, and worked properly at that time.

### Benefits

The main benefit in the short run was that the Biathlon World Championships could be run with a lower environmental impact. If there had been a fault, there would not have been any need to generate electricity from fossil diesel, but electricity delivery could have continued from the grid.

In the long run, the new installations strengthen the grid in Östersund, especially close to the ski stadium. While this installation had a very specific purpose from the start, it will continue to offer good monitoring possibilities in parts of the grid and also served as a testbed for this kind of installations.

### Scalability

The system is scalable, as new installations with similar characteristics can be added to any loop in the grid.

### Interoperability

The installations are interoperable with the current grid and makes the electricity delivery in the entire area more robust. The sensors were installed both in new and present network stations, without any interruption to delivery.

### Investment horizon

The investment payback time is hard to estimate, as the project was done for a very specific cause. The value of having no interruptions during the World Biathlon Championships is not easily translated into money.

## International potential

To strengthen the power grid with smart technology before events such as large sporting events, festivals or concerts can be a way to market the event as environment friendly in the future. This could be done at events anywhere internationally.