

Location: Russia, South Ural

case study: 04-2021

# Snow making at a mountain ski resort



*The Pump People®*

## BACKGROUND

Winters are long in the middle of Russia and last usually from November to April. The Ural is a long and old chain of mountains, which starts from the north, at the Barentz Sea, and goes down to Kazakhstan. The Ural Mountains are not as high as the Alps but are as good of a playground for skiing. In spite of long winters, the owners of the resorts aim to make the high season last as long as possible. The season is limited by the presence of snow and therefore, they found a solution to make it last longer: producing artificial snow. This process starts in early October, when night temperatures go below zero. Cold water sprayed at high pressure through many nozzles turns into snow; falls down on the slopes; and after several nights of work, the snow level is enough to make it a good track for skiers. Usually, it needs about 300-400 m<sup>3</sup>/h of water with the outlet pressure at 3-4 bars to provide all snow guns of a resort with water.

There are usually two pumping stations in this artificial snow application.

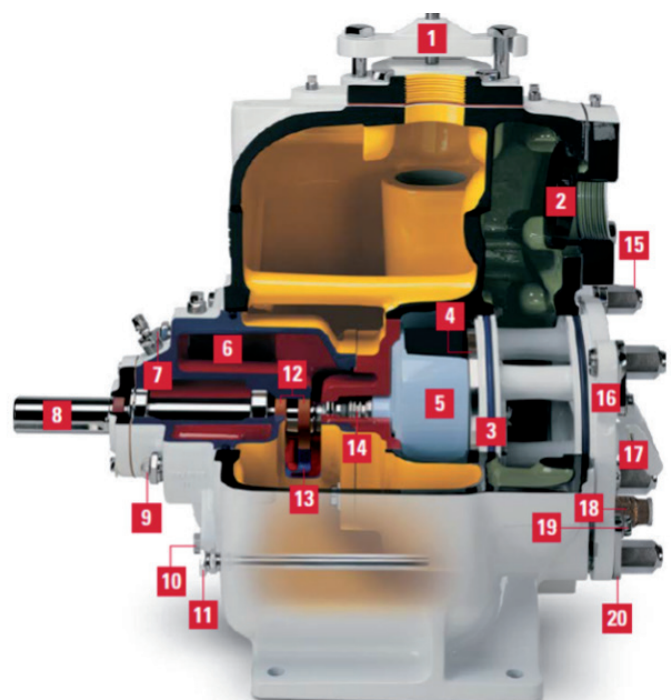
The first pumping station is located near the water intake, usually a lake or a river. Traditionally, in Russia they use submersible pumps at that stage.

The second one is located at the foot of the slopes, directly spraying the water in the nozzles of the snowmaking machine.

This second application includes high-pressure multistage pumps.

In our case, Gorman-Rupp offered a replacement solution for the first pumping station.

*Right: NB: When working with freezing temperature, please consider using a Gorman-Rupp Volute casing heater (number 11 on drawing). This device is equipped with a sensor temperature and will prevent the liquid from freezing and resulting damage to the pump. It switches on when the liquid goes below 2°C.*



## THE CHALLENGE

The customer was very familiar with submersible pumps and satisfied with them. At least, he thought he was. At the begin of the project, he even did not want to hear about any other alternative solution. He already had one snow making system in place and decided to build another one because the mountain resort was expanding. His system included a first pumping station with two submersible pumps (one working, second in standby) and second pumping station with high-pressure pumps as described above. Only the first pumping station needed to be replaced. The customer was happy with his initial system and asked us to provide the same kind of submersible pumps he already had. He had never heard anything about self-priming pumps and was about to be even happier. Indeed, he was delighted when we offered him a Gorman-Rupp self-priming pump as he found out that he didn't need to build a complicated and costly concrete construction at the bottom of the river for submersible pumps anymore and could install a much easier solution on the level of the ground.



*Gorman-Rupp super T8 pump for priming the water from the lake*



*Artificial snow being sprayed on the slopes*

## THE SOLUTION

We supplied a T8A3S-B/FM SuperT series pump for the duty point:  $Q=400 \text{ m}^3/\text{h}$ , 24 m, V-belt driven with 30 kW 1500 RPM motor. The customer installed it into a small wooden house near the river. We had to be extra careful with our NPSH calculation. Since the ski resort is located on a high altitude, the atmospheric pressure is less than at sea level. Luckily, the suction lift was not high, only 3 m. The pump fitted perfectly to the application creating 1 bar pressure at the second pumping station equipped with high pressure pumps located at the bottom of the slope (they require 0,5-2 bar for normal work). Only a suction pipe remains in the river, all other equipment is above.

## THE RESULT

Although the Gorman-Rupp pump set alone was more expensive than two submersible pumps, the complete system installation we proposed was more profitable and that is what convinced the client. At Gorman-Rupp, we talk about **the complete system**, it is not only about the pump. He was genuinely satisfied by the solution and realized that it is better than his old submersible pumps not only because of the easier and cheaper installation but because of easier maintenance too. After a while, he bought a spare rotating assembly instead of a spare pump and he is convinced by that option as he can always repair his pump within an hour (which he didn't need to do since then). Today, he wants to reconstruct an old snow making system and is going to replace old submersible pumps by new self-priming Gorman-Rupp pumps.



*The cabin containing the Gorman-Rupp T8 pump set*



### GORMAN-RUPP NETHERLANDS

Zandweistraat 19  
NL-4181 CG Waardenburg  
Tel: +31 (0)85 7730080  
Email: GREsales@gormanrupp.com

### GORMAN-RUPP BELGIUM

Rue des Métiers  
B-5020 Suarlée (Namur)  
Tel: +32 (0)81 779977  
Email: info@be.gormanrupp.com

