



**FROST  
CONSULTING  
GROUP**



**ITT Goulds Pumps**

## **DOWNHOLE GEOTHERMAL PUMPS FOR THE POWER INDUSTRY**

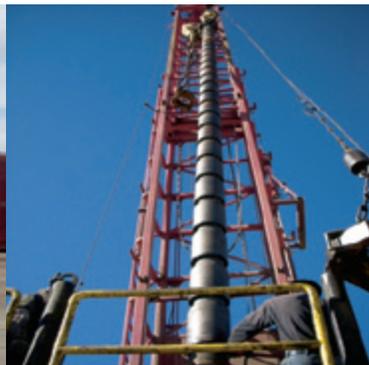


**Frost Consulting Group is the  
Exclusive Agent,  
Consultant and Design Engineer for  
Geothermal Pumps manufactured and  
serviced by ITT Goulds Pumps**

**30 Years Experience in Geothermal  
The Pioneer, The Innovator, The Leader**

**Designs, Sales, Service,  
Field Consulting –  
Installation, Start-Up, Training**

**Wide range of flow rates, deep settings,  
high temperatures, high horsepower,  
long life**



**Frost Consulting Group**  
**[www.frostconsultinggroup.net](http://www.frostconsultinggroup.net) (909) 899-9538**

## TESTIMONIALS

It has been my privilege to work with Jack as a customer and a friend in the geothermal industry for nearly 30 years. Through this time Jack has been the prime mover in the development of pumps for our industry. From the drawing board to the field application, Jack took it upon himself to understand and guide every step of the design & development process including every detail of the field installation, operation, failure analysis and redesign. He has hands-on familiarity with not only the pumps but the wells they go in and the equipment and the people who install them, operate them and repair them. If he looks a little weather-beaten, it's because of a lot of hard days and nights in the field.

Simply stated, he is the world's expert on geothermal production well pumps and their applications.

More importantly, Jack is a man of character. He is driven by a genuine desire to provide a quality product and to help his customers achieve success and he is quick to give credit to the ITT Goulds Pumps team for the support that makes it possible for Jack to do what he does for our industry.

*Bob Verity, Ormat Nevada Inc.*

**As far as GeothermEx is concerned you are the best expert in the Geothermal Pump business.**

*Subir Sanyal, GeothermEx Inc.*

Goulds Pumps and Frost Consulting have played a large role in the imminent successful startup of the Raft River Unit 1 geothermal power plant. Goulds Pumps and Frost Consulting offered a record of quality equipment, customer service, and long-term reliability that was the deciding factor in the selection of Goulds Pumps ... and went far beyond the letter of the contract.

Jack's assistance has been an enormous asset to US Geothermal, including his willingness to come to the site and supervise running the pumps into the wells. While at the site, Jack conducted training on downhole pumps and provided hands-on training for the operating staff while the pump was being installed.

Jack is dedicated to the success of his customers, and will work whatever hours and tackle whatever tasks are required to ensure that success.

*Kevin Kitz, US Geothermal Inc.*

**As I was told years ago, Jack Frost is the world's geothermal pump expert and you have proven it on our NGP Faulkner Geothermal Power project. Jack's patience, dedication, hard work and many long hours and days to our project has concluded with the successful operation of our production wells. It has been a pleasure working with someone with such dedication and we look forward to our continued relationship.**

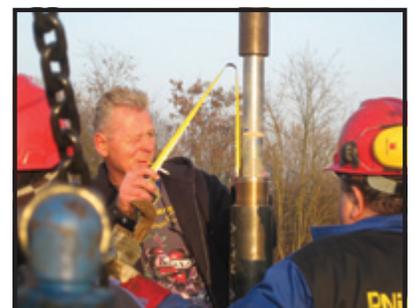
*Max Walenciak, Nevada Geothermal Power*

Jack Frost designed a lineshaft for the Landau, Germany geothermal plant for Bestec GmbH. He personally supervised the installation and start-up with a lot of enthusiasm and professionalism. The pump design turned out to be well adapted to the hydraulic and temperature conditions in the Landau reservoir as Jack had predicted. All operations from pump installation to plant start-up were conducted as planned and without incident. Without his broad knowledge, advice and support this would not have been possible.

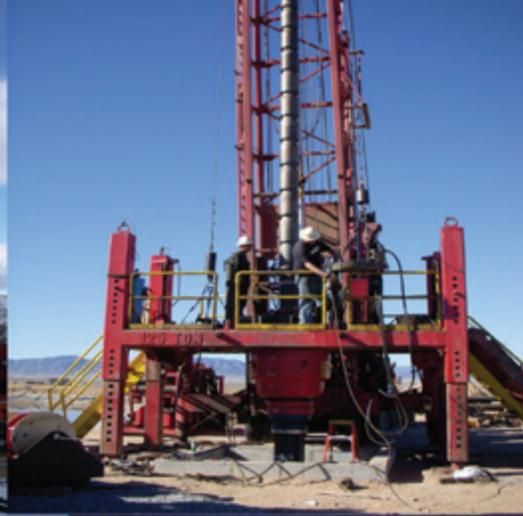
*Dr. Jorg Baumgartner, Bestec GmbH (Germany)*

**I just wanted to thank you, Jack, for all of your help, now and over the years. You have been a great teacher and a source of inspiration for me.**

*Shawn Henry, Magma Energy Inc.*



*Jack A. Frost*



“This is without a doubt, the most difficult application you can put a centrifugal pump into. When you are banking on revenue, this is not the place for the novice, a salesman, an engineer without years of field experience *in geothermal* or even a manufacturer relying upon my out-dated 25 year old designs.

I’m frequently asked what are the qualifications for doing what I do. The short answer is a roughneck with an engineering degree. When you need to rely upon the pump supplier, you need someone who can, first of all, interpret flow test data and well profiles to properly size a pump. Who is he going to send to the field? This is dangerous business. Does he know how to kill the well? Know how to run a rig? How to install the pump? The tension loads, the torques, the weights? What about start-up? None of this is like some simple water well pump. What about stock inventory to turn a pump around to minimize down-time? Everyone wants to get into this market right now ... decisions based on price will result in severe mistakes, huge cost over-runs and black-eyes to an industry that should be proliferating. All I need is reasonably good data to make it work ... or tell you what needs to be done to make it work. If we can’t do it, no one can.”

Jack A. Frost

- Mechanical Engineering, Business Marketing, Business Law -UCLA, CSULA
- Engineering & Marketing management positions with industrial vertical turbine pump manufacturers since 1971
- Credited with designing the first commercial downhole geothermal pump in 1979
- Frost Consulting established in 1988 (later incorporated to Frost Consulting Group)
- Designed the first of Goulds Pumps’ downhole geothermal pumps in 1988
- Established exclusive rights to represent Goulds Pumps in the downhole geothermal market in 1989.
- Estimated 85% of existing downhole geothermal pumps in operation today are of Frost Consulting-Goulds Pumps supply

Partial List of Clients & Sites (2008)

- Ormat Nevada- East Mesa (Ormesa I, Ormesa II, Ormesa IE, Ormesa 1H, GEM 1, GEM 2)
- Ormat Nevada-Heber Facilities
- Ormat Nevada-Heber South
- Ormat Nevada-North Brawley
- Ormat Nevada-Brady Power
- Ormat Nevada-Desert Peak
- Ormat Nevada-Steamboat Facilities, Galena Projects
- US Geothermal-Raft River
- US Geothermal-San Emidio
- Raser Technologies-Thermo, Utah
- Nevada Geothermal Power-Blue Mountain
- Mammoth Pacific
- Geox / Bestec- Landau in der Pflatz, Germany
- Magma Energy-Soda Lake (formerly Constellation Operating-Soda Lake)



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