



## Alternative Energy Projects & **THERMINOL**® Technical Services: *A Powerful Combination*

Therminol® heat transfer fluids are being selected in alternative energy projects because of their superior, proven performance over a wide temperature range in related applications. For decades Therminol heat transfer fluids have been used in conventional natural gas processing applications. With the creation of an abundance of new projects to harness alternative energy sources, the use of Therminol has expanded to projects involving biofuels, cogeneration, fuel cells, nanotechnology, oil sands, and solar energy. These alternative energy projects share a common theme--the energy they harness is no longer based on traditional petroleum or nuclear based sources. Instead, the energy involved in these projects is from resources such as waste heat, renewables and from nature itself. This report will discuss how Pristine Power Inc., EnPower Green Energy Generation Limited Partnership, and Chinook Engineering partnered with Solutia's Therminol heat transfer fluids technical service team to solve a green energy initiative challenge put forth by emerging governmental regulation.

In 2002, the Canadian province of British Columbia (BC) passed a clean energy act that required a major power producer, BC Hydro, to meet 50% of its new power needs from renewable sources and cogeneration. In 2007, the province increased the clean energy requirement to 90%. This is an example of a government initiative to spur the development of energy alternatives that has met with success in British Columbia. A company that has seen this initiative as an opportunity to employ its expertise is Pristine Power Inc. of Calgary, Alberta (AB).

Pristine Power is in the business of developing, owning and operating independent power plants that will produce and sell electricity and in some cases, sell process steam to industrial users. Pristine

Power Inc. and ENMAX Green Power Inc. announced in September 2008 that commercial operations have started at their jointly owned EnPower Energy Recovery Generation (ERG®) projects in British



Savona ERG® Facility: Waste Heat Oil Heater

Columbia under the terms of a 20-year electricity purchase agreement with BC Hydro. These new plants convert waste heat from the gas pipeline into electricity. Their two BC plants will produce a total of 10 MW of clean energy and offset 25,000 tonnes of greenhouse gases (GHG) annually.

The first plant, located in Savona BC, generates electricity from waste heat created by existing gas compressors on Spectra Energy's main natural gas pipeline. The ERG process starts by transferring the waste heat to Therminol heat transfer fluid. The hot Therminol is then used to vaporize a separate working fluid which is used in an organic Rankine cycle for power

generation. ERG projects use proven technologies and similar systems are used on pipeline compressors and in geothermal applications around the world. The Savona project is the first of two EnPower 5 MW projects in the province. The other 5 MW project on the same pipeline at 150 Mile House BC began operations in October 2008.

EnPower was formed by its owners to manage the projects for waste heat recovery in western Canada and was responsible for the construction of the 5 MW cogeneration projects at 150 Mile House and Savona, BC. Chinook Engineering Ltd. of Vancouver, BC was commissioned by EnPower to provide the engineering design for these projects. The challenge that confronted Chinook Engineering was finding a heat transfer fluid that could meet performance requirements, have a proven track record and could be used in a low pressure system. Mr. Randy Bohl, mechanical engineer at Chinook Engineering, was assigned the task of finding such a heat transfer fluid.

Early in the process, Mr. Bohl contacted the Therminol technical service team of Solutia for assistance on information regarding heat transfer fluids. Mr. Bohl discussed his needs with Mr. Ravi Prakash, senior Therminol technical service specialist, thus embarking on a long term relationship from the initial stages of the project through construction and to start up of the heat transfer fluid system.

"There were important yet simple lessons to be learned from this relationship and the initiative on behalf of Chinook Engineering that could benefit many engineering companies on their projects," said Mr. Prakash. "The important starting point is that Randy contacted us early in the process so we could assist with a thorough design review of their system. Sometimes we are consulted after the fact and important criteria for a well designed

system may be overlooked. So, we request engineering companies to contact us early should they think they may need our advice. Fortunately in this case, Randy got us involved nearly from the beginning, avoiding many of the design pitfalls that can happen.” This guidance offered at no additional charge by the Therminol technical services team is a vital part of the TLC Total Lifecycle Care® program. Mr. Prakash adds, “In addition to the design review we also have a toll free technical services hotline that is available to handle inquiries on a routine basis. For the EnPower project we also provided a comprehensive engineering seminar at Chinook that was created with the needs of the design engineer in mind. We then followed up with an on-site training seminar at Spectra, the end-user, which focused on the safe use, operation and maintenance of its new Therminol heat transfer fluid system.”



Savona ERG® facility: Organic Rankine Cycle Air Cooled Condenser

Mr. Brad McCann, National Market Manager for Solutia Canada echoes the sentiment of Mr. Prakash: “Solutia has over 45 years of experience in the use of Therminol heat transfer fluids with thousands of systems worldwide. We use Therminol fluids in our own manufacturing facilities.” Mr. McCann was responsible for the commercial coordination of the services and product offerings to Pristine/EnPower, Chinook, and Spectra. Mr. McCann adds, “We are willing to share this experience with all stakeholders for projects involving Therminol heat transfer fluid. That experience extends not only from project conception to design and to construction but also to the end-users. We offer the end-user an unparalleled technical support program that provides start up assistance, operator training, sample

analysis and troubleshooting assistance. Although we have assisted customers with conversions of existing systems to Therminol from other fluids, the key to success for new system designers is to contact the experienced engineers at the Therminol technical services team in the conception stage to help ensure that the

system is well designed. We can then offer training to the end-user to help ensure the well-designed system is also well-operated and well-maintained.”

Mike Rekrutiak, Project Manager for EnPower Green Energy Generation, supports Mr. McCann’s comments regarding the technical services offered by Solutia during the early stages of project design. Mr. Rekrutiak states: “We had some special needs for a low pressure system at Savona and were in the beginning phase of several new projects on the Spectra Energy Natural Gas Pipeline in British Columbia. The engineers at Therminol understood our concerns and suggested Therminol 55 for these projects that met

the low pressure requirement as well our performance needs. Also, the commercial team at Solutia was helpful for ensuring on-time deliveries of Therminol to these locations. We are pleased with the technical and commercial support we have received from the Therminol team and would not hesitate to recommend their service for our future projects and to other project management and engineering firms.”

Mr. Prakash says “we have worked with thousands of satisfied customers worldwide for many, many years. While we realize that the typical components of heat transfer systems are often similar, each system is still unique and requires care and attention since the differences may be in the details -- the same details that may get overlooked. The benefits from working with an experienced heat transfer fluid technical services team in the project design phase are clear. The result of beginning with a well designed system is safer operation, more efficient start-ups, better on stream time, and requires less energy and less heat transfer fluid in the long term.”

Mr. McCann concludes, “Solutia sees many benefits coming from the influx of energy-related projects in which we have been involved and encourages prospective project managers and engineering firms to contact the engineers in the technical services group in the early stages of these projects. I believe that the proactive efforts of alternative energy companies such as Pristine/EnPower, Chinook Engineering and Spectra of contacting us in the conception stage will benefit their generation projects for many years to come.”

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