

*Waukesha Engine Case History Series*

## Extreme conditions fail to sideline ATGL engines at gas storage site



**Subject:**  
Unocal Gas Storage Facility, Aitken Creek, British Columbia

**Facility Profile:**  
The only gas storage site in British Columbia, the Aitken Creek facility sits on top of a naturally made and perfectly sealed storage field that measures 2 miles by 3 miles (3.2 km by 4.8 km). Aitken Creek accepts gas from processing plants throughout northeast British Columbia, stores it, then pumps it down the Westcoast Pipeline in the fall and winter—when demand is high—to Vancouver and the northwestern United States.

**Installation Requirements:**  
The facility operates 24 hours a day, 365 days a year, constantly moving natural gas into the storage field, or pumping it out of storage and down the pipeline. Single-stage, reciprocating compressors move the gas at discharge rates from 1200 to 1700 psi (83 to 117 bar). During peak demand periods, each compressor can move as much as 70 million cubic feet of gas per day.

**Waukesha Equipment:**  
Of the 10 compressors on site, seven are driven by Waukesha 12V-ATGL lean-combustion, constant-torque engines. The engines run at 2650 bhp (1980 kWb), at 1000 rpm. The engines are serviced by Waukesha Engine's Canadian distributor, PAMCO, a division of Enerflex Systems Ltd.

**Compression History:**  
Unocal opened the Aitken Creek storage facility in 1987. The first Waukesha ATGL was specified in 1990, the second in 1992, and the last five AT engine-compressor systems were installed in 1993. The two oldest ATGL engines are in constant operation; the other five are used on an as-needed basis—particularly at the end of the natural gas selling cycle when additional compressors are needed to force the remaining gas out of the storage field and down the pipeline.

**Why Waukesha:**  
Aitken Creek is located at Mile 115 of the Alaska Highway in northeast British Columbia. Temperatures routinely drop to -40°F (-40°C), difficult conditions for operating gas engines. And due to provincial emission requirements, Unocal had to specify clean-burning, lean-combustion engines. As an example of Unocal's confidence in Waukesha, the continuous-running ATGL engines run at 102% of their rated load.

**Unique Characteristics:**  
In 1990, Waukesha Engine had never placed an AT engine as far north as Aitken Creek. Using the application to fine-tune AT operation in a cold climate, Waukesha engineers adapted the engines to the conditions as well as Unocal's requirements. The result is that the ATGL engines now have upgraded cylinder heads and liners, improved exhaust manifolds and an air/fuel ratio control system that meets Canadian Standards Association hazardous location requirements.

**Cost Effectiveness:**  
Cylinder head life on the two ATGL engines in constant operation far exceeds those of competitive engines at the facility. Initial overhauls were performed at 25,000 hours, and in both cases the heads showed minimum wear. On-site mechanics perform regular service, including oil changes at 2,250 hours and spark plug changes at 3,000-6,000 hours, based on loads. All engine maintenance is performed by certified PAMCO technicians based out of the distributor's Fort St. John branch.

For more information on this Waukesha Engine installation, or Waukesha's gas compression capabilities, contact Waukesha Engine Division, A Dresser Company, 1000 West St. Paul Ave., Waukesha, WI 53188-4999, (414) 547-3311, Fax: (414) 549-2795.



Senior Operator Marcel Levac monitors the control panel at the Aitken Creek gas storage site.



Left, Operator Darwin Kilbreath checks the oil of the oldest Waukesha ATGL engine on site. The engine is approaching 50,000 hours. Above, there are seven ATGL engines operating at Aitken Creek.



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A Dresser Company  
1000 West St. Paul Ave.  
Waukesha, WI 53188-4999  
(414) 547-3311  
Fax: (414) 549-2795

Waukesha Engine Division  
Dresser International Products, b.v.  
Farmsumerweg 43, Postbus 330,  
9900 AH Appingedam  
The Netherlands  
(31) 596-652222  
Fax: (31) 596-628111

*“The reliability of the ATGL engines has been outstanding. With the severe weather conditions this far north, the proof has been the performance; Waukesha has backed up its engines with excellent service.”*

*Jim Pederson  
Senior Production Foreman  
Unocal Canada Limited*



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