



## THE WIND ENABLER RETURNS TO TEXAS, USA

The Golden Spread Electric Cooperative (GSEC) is a consumer-owned utility that provides power for 16 member distribution cooperatives serving 208,000 end consumers in the Southwest Power Pool (SPP) in the United States. One of the markets catered for by this electric energy network is Texas, a windy and arid area characterised by significant quantities of wind power generation.

GSEC debated different back-up power alternatives for addressing the challenges associated with their high proportion of intermittent wind-driven generating capacity. Agricultural

irrigation, with its heavily varying demand for electricity, adds to the power balance equation, further increasing the flexibility demands on the wind-following plant. With all these challenges adding up, GSEC turned to Wärtsilä, in order to obtain suitable backup power.

Together with low levels of emissions, Wärtsilä gas-fired technology offers flexible operation, including the ability to start up and shut down at very short notice. As water resources are scarce in Texas, the low water consumption of the technology represents a major benefit. Mark W. Schwartz, President & General Manager, GSEC confirms: "There are other technologies out there, but what led us to the decision to pick the Wärtsiläs [i.e. the Wärtsilä engines], was that they start very quickly and are efficient units."

The requirement to deliver full output in the hot summer months of Texas presented yet another interesting challenge. Not only is the plant

located 3350 ft (1020 m) above sea level, but the ambient temperatures there are rather extreme, ranging from a low of -10°F in winter to a high of 105°F in summer (-23°C to 41°C). Thankfully, Wärtsilä's combustion engines can cope with both freezing and hot temperatures with minimal derating. However, as large quantities of glycol are needed to protect the cooling circuits in winter, this would result in the engines having to be derated in summer. The issue was solved by introducing two different cooling water configurations. Two separate tanks were constructed – one holding cooling liquid ■ ■ ■

” Wärtsilä engines start very quickly and are efficient units.”

Mark W. Schwartz,  
President & General Manager, GSEC



THE CHALLENGE	WÄRTSILÄ'S SOLUTION	BENEFIT
Fluctuating output from wind generation	Internal combustion engines with excellent ramp rates	Excellent operational flexibility & increased revenue from selling balancing capacity
Fluctuating load due to irrigation processes	Multi-unit plant	Very high efficiency over the whole load range & no start/stop penalties
Scarce water resources	Closed-circuit radiator cooling	Negligible water consumption
Hefty temperature variations: -10–105°F (-23–41°C)	Two different cooling water configurations	Nominal plant output and efficiency reached both in winter and summer
Very tight project schedule	Seasoned project team working in close cooperation with the customer	Delivery ahead of schedule in order to meet changed customer needs

■ ■ ■ containing glycol and the other for cooling water alone – and the type of cooling water used can be swapped. This solution allows full output and the efficiency of the plant across the entire temperature range.

The quick-starting power plant of GSEC, suitably named “Antelope” Station, consists of 18 Wärtsilä 34SG generating sets. Mark W. Schwartz especially highlights the value of the plant’s multi-unit setup: “They provide multiple shafts, which gives us shaft diversity so we can bring generation on in small increments. This

**As a US first, Antelope Station has the capability to generate full output for all eighteen engines in less than five minutes.**

we feel will have value in the markets that we participate in.”

The delivery included mechanical, electrical and control auxiliaries, switchgear and exhaust

emission control solutions. Additionally, Wärtsilä provided installation and commissioning support, as well as factory training for the local plant operation crew.

The project timeline was tight, with operation originally scheduled to begin in 2012, but as forecasts indicated that demand in the summer of 2011 would be higher than anticipated, Golden Spread was keen to have the plant up and running as quickly as possible. The plant was successfully commissioned in the early summer of 2011 – way ahead of schedule.



Antelope Station, Texas, USA



**MAIN DATA**

Customer .....	GSEC(Utility)
Type .....	Wärtsilä 34 gas grid stability
Operating mode .....	Peak load/stand-by & emergency
Gensets .....	18 x Wärtsilä 20V34SG
Total output .....	170 MW
Fuel .....	Natural gas
Scope .....	EEQ (Engineering & Equipment)
Delivered .....	2011

