



Adding a TEG to Add Reliability to Solar Power on a Wellhead in Haynesville



Model
P-5100

The Situation

An upstream gas producer in Haynesville needed to address the unreliable power issues that were plaguing their new electric valve actuators. The electric actuators were installed to replace older pneumatic dump valves to eliminate methane venting to the atmosphere. An electrically controlled solenoid (11W) was installed for an emergency shutdown operation with a Flowboss 107 PLC 107 with modem (12W), and solar panels were installed with battery backup to power these critical devices.

The Problem

The solar system was unable to provide reliable power, leading to intermittent and unpredictable equipment failures. These failures increase operational risks, decrease production throughput, and cause unexpected operating costs to remediate the issues. The root cause of the failures ranged from solar controller errors, unfavourable weather and battery depletion rates. Although an onsite combustion engine generator was available, it wasn't used due to high rental prices, short run time to service intervals, and ongoing maintenance costs. Wind turbine power was considered, but was not selected due to the intermittent reliability of power generation as well. An ultra-reliable, low maintenance, low power generator solution was needed.

The Implication

When power to critical devices fails, there is lost production, risk to operations, unexpected maintenance costs and delay to other planned activities. A shut in well can result in tens of thousands of dollars in lost revenue per hour. Technicians must be dispatched to troubleshoot the root cause and find a solution. But some issues, like the area-wide freeze in February of 2021 impacted all well pads in the region simultaneously and couldn't be resolved until repairs and replacements were done, and favorable solar power weather returned.



Product Summary
Model P-5100 Teg



Market
Well pad



Location
Carthage, TX, USA

CASE STUDY



Well pad site near Carthage, TX.



Well pad site near Carthage, TX.

The Solution

The operator opted for a single, P-5100 TEG at each of their two-well sites. By selecting the remote start version of the P-5100, they were able to create an H-TEG, or Hybrid solar TEG, configuration for the highest possible reliability with the lowest possible emissions for their sites. The H-TEGs were plugged into the existing charge controller, and produced enough excess power for the Emergency Shut-Down (ESD) signaling solenoid (11W constant load). The H-TEGs constantly float charge the batteries for improved redundancy and also extends the life of the batteries by two-fold. Through avoidance of unexpected shut-ins and field service trips, the operator expects to save tens of thousands of dollars annually.

After installation of the P-5100 H-TEG, technician call outs due to power outages were eliminated and battery voltage stayed at a constant 26.3V (fully charged), day and night, through cold, hot, cloudy and inclement weather. With each H-TEG combusting methane to a 99.99% destruction, and in remote start mode, consuming only 66SCF (20% duty cycle) per day, the H-TEG provides an excellent green solution for off grid power. When using the H-TEG in a remote start configuration, fuel consumption and GHG emissions is further reduced by as much as 90% depending upon the insolation, weather, and solar sizing.

Although these particular well pads are in rural, isolated areas, theft of batteries and solar panels are not uncommon in these unmanned areas. TEGs have the distinct advantage of being warm to the touch and have visible gas line connections, so are almost always bypassed by solar thieves. If thieves do steal the solar panels and batteries, site power can be quickly restored with a pure TEG solution until the solar panels, batteries and charge controllers can be replaced.

Benefits of an H-TEG System

- ⚡ Highest reliability power generation maximizes production revenues.
- ⚡ Reliable power regardless of weather conditions (TEG power).
- ⚡ Reliable power in case of gas interruption (solar & battery power).
- ⚡ TEG have a 20+ year design life when properly set up and maintained.
- ⚡ H-TEGs can be added to your existing solar setup, leveraging renewable assets while increasing reliability.
- ⚡ TEGs have a small footprint for adding to existing sites or fitting into small greenfield sites.
- ⚡ P-5100 TEG is only 15.4" w x 31.1" d x 39.1" h (pole mount adds about 2-3' of height).
- ⚡ The P-5100 has built-in flame arrestor for safe shutoff of the TEG, which gives comfort moving it within 30' of the wells.
- ⚡ Avoid GENSET rental costs (typically \$5000/month).
- ⚡ Simple maintenance with easy to follow training available.
- ⚡ Support available locally and internationally.



There's only one company that provides reliable, cost-effective off-grid power to some of the most remote and environmentally challenging places on Earth... Global Power Technologies.

Global Power Technologies (GPT) was established in 1975 to commercialize thermoelectric generator technology originally developed for the Apollo Space Program. Today, GPT is the world leader in the manufacturing and distribution of thermoelectric generators (TEGs) for use as remote power sources.

GPT manufactures a range of generators, from 5 to 550 watts, using heat to directly produce electrical power for applications requiring up to 5,000 watts of power. GPT generators operate on natural gas, propane, or liquefied petroleum gas to provide highly reliable, cost-effective, **Power when you need it.**