BEAM GAS COMPRESSOR THE GREENEST OF COMPRESSION SYSTEMS

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The Beam Gas Compressor ™ (BGC) is being used in many states of this country to provide compression at the well head in a GREEN fashion. This paper will show how the BGC, by utilizing its design features, eliminates noise and emissions and creates more energy than it uses thereby the nomenclature "GREEN MACHINE".

Noise: The BGC does not require its own energy source to create up to nine ratios of compression. The BGC is uniquely designed to use the normal pumping action of the pump jack already on location. The size of the BGC is determined by the current relationships of the pumping units mechanics, production of the well and downstream effects of the sales line. Thusly the BGC creates no noise on its own over and above what ever the current pump jack already creates. Recently we replaced a gas engine screw compressor because the well it was on was across the stream from a Trout Fishing Camp this was a delicate area and the noise of the other style compressor meant that the well was basically shut down for trout fishing season and a loss of over 8 bpd of oil production occurred.

Emissions: In many states existing pumping units that are run on natural gas motors are or will be grandfathered in to new rules on "cap and trade" or GreenHouse Emission Gases. The current "footprint" of a well will be determined to be "X" and operators will probably not be able to increase "X" without a financial cost that will exceed the actual expense. With a BGC there are no emissions as stated above and there by no increase will be needed in the "footprint" of the well. In many cases if a current means of compression is being used the size of the footprint can actually decrease by switching to a green machine.

In 2009 multiple wells having conventional gas powered as well as electric powered skid mounted compressors were replaced by BGC's due to the cost of operating. At the sites where we made the replacements the compressors were using an average of 20 mcfd to fuel there motors. This cost is about $29,200 per year per well of wasted energy and expense. In contrast the BGC's when installed showed incremental increases of horse power by the prime mover of the pumping unit and at subsequent significant lower operation costs. Not to mention the cost of the other compressor for monthly rental in most cases exceeding $2,500 per month or $30,000 per year. In total this represents an increase of $60,000 per year to the up side of these wells.

Energy Used Vs Created: For over 30 years the BGC has been installed on existing pumping units only to find that, in almost every case, the existing prime mover was sufficient to lift the rods and operate the BGC to compress the casing head gas into the flow line or sales line. In studies performed on several different pumping units with BGC's installed the energy requirements were measured to determine the amount of energy expended to operate the Pumping Unit when the BGC was and was not engaged.

As you can see, in the table, the amount of additional energy is nominal and the wells generate over x amount of additional production when the BGC is engaged.

- Study #3 was installed with two Beam Gas Compressors on the same pumping unit – one behind the Sampson Post next to the gear box and the other one installed between the Sampson Post and the well head.

The Beam Gas Compressors operates basically by the walking beam movement that pumps the well, the Beam Gas Compressor draws produced gas from the casing through check valves and discharges it into the flow line down stream from the pumping tee. The gas rejoins the tubing production and flows to the separator and on to the gas sales line.

BGC FEATURES

The BGC utilizes a clamping system to mount the BGC to the walking beam and the pumping unit skid. This method of clamping prevents the need for welding on the PU.

The BGC is Double Acting and compresses gas in both the up and down motion of the pumping unit. The counter balance of the pumping unit is not affected.

The BGC™ is manufactured to operate in all corrosive environments as well as wet and high BTU gases and has been installed on virtually every style-pumping unit.

The Pump Jack is the prime mover for the BGC and allows the kinetic energy stored in the motion of the weights and rods to do most of the work.

The BGC can be moved to other wells

Field service in minimal which reduces the time Pumpers and Lease Operators spend on day-to-day maintenance.

PRODUCTIVITY INDEX

Each formation is different in its response to back pressure or a reduction of back pressure. The producing formations that have good porosity and a good productivity index (PI) will give the best results when the back pressure is reduced. The productivity index is defined as the amount of increased fluid the well will give up for each pound of draw-down or pressure reduction achieved at the formation.

In other words, if a well has a "PI" of one, then for each pound of pressure relieved from the face of the formation the well will give up one barrel of fluid. So when looking for an increase in production, we look at wells that have a high PI. For example, a well with a PI of 0.5 and a wellhead back pressure of 50 PSI will increase 25 barrels a day when the wellhead pressure is reduced to 0 PSI.

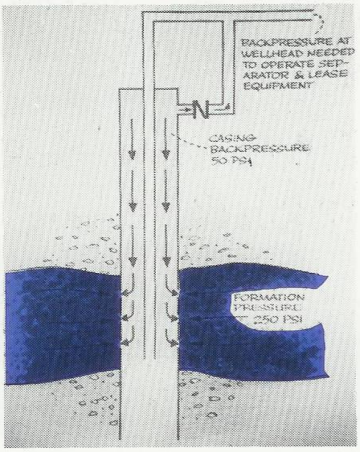
When a well is drilled and placed in production, it normally has a good bottom hole pressure and will often flow, provided the bottom hole pressure is high enough to overcome the surface back pressure and fluid gradient. As the well continues to produce, and the bottom hole pressure declines, the surface pressure becomes a factor, and the well will ultimately be placed on some type of artificial lift – the most common of which is the rod pump.

As the well continues to produce, the bottom hole pressure continues to decline until the surface back pressure required to operate the lease equipment and pass produced gas through the sales meter becomes a greater percentage of the depleted bottom hole pressure. This is when the operator should consider a back pressure relief tool such as the Beam Gas Compressor.

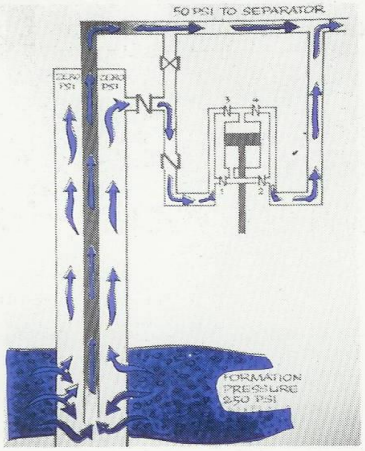
					BGC In Service		BGC Out of Service	
	Type PU	Size PU	HP of PU	Diameter BGC	Amps Startup	Amp Range	Amps Startup	Amp Range
Study #1	Mark II	456	40	12"	318	38-76	317.9	36-76.7
Study #2	Conv	640	40	14"	425	33-33.5	416.3	32-34.5
* Study #3	Conv	640	40	18" X 18"	547.8	45.5-49	539.4	47.5-47.5
Study #4	Conv	640	40	16"	496.5	34-66	518	34-61

Before the BGC

Restricting Back pressure holds back the flow of Hydrocarbons into the well bore.



After the BGC



Back pressure is relieved from the face of the formation allowing more hydrocarbons to flow into the well bore.

Installation begins on a BGC and the skid compressor to the left that will be removed

Skid compressor soon to be replaced with a BGC