POWER SENTRY®

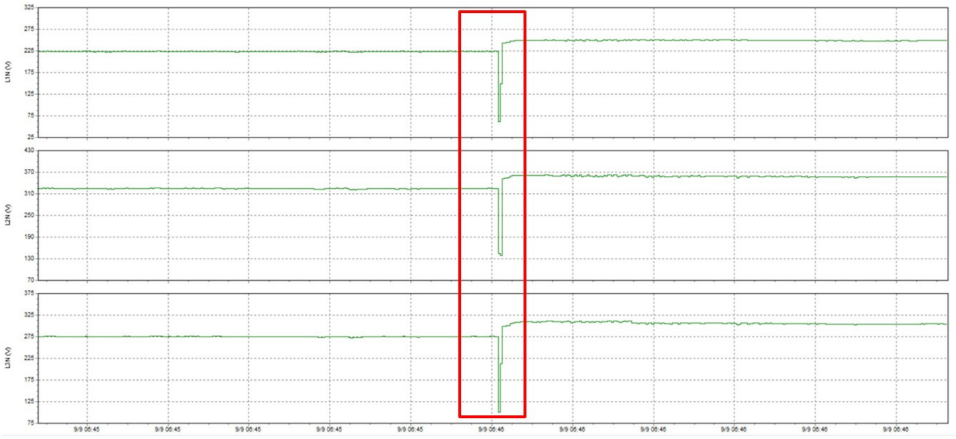
Electrical Ride Through

The Permian Basin is an area fraught with power disturbance issues. Events routinely cause negative impact to the continual production of the clients ESP wells. Queue ERT, a technology designed to keep VSD's/ESP's online during sags, brown outs and full 3-phase outages. Power Sentry engaged with a west Texas based client to champion a pilot on the Superior 115H well, north of Midland. On the 11th July 2020, one ERT was installed on a 390KVA Schlumberger drive, loaded at between 55-85%. All operations conducted by Power Sentry and third party contractors were performed safely and without incident. Below is a summary of the trial periods findings and a review of ERTs economics.

ERT - 1, Thunderstorm - 0

Power Sentry's ERT was effectively able to manage several dozen events experienced by the VSD throughout the 90 day trial. For pilot purposes, an 'event' was defined as any situation where the ERT provides >10A. Of the fifty events experienced during the trial period one event on the 9th of September resulted in a full field outage, minus the one well connected to ERT. As a storm rolled through the area, all surrounding drives shut down at 03:46:31, because of a voltage drop lasting a mere 4.1 milliseconds. In the graph below you can see a significant dip occur on all three phases. Ultimately the ERT was called upon to provide 51 amps throughout the event, saving the well from shutting down and maintaining production.

Plot #1
3-phase electrical input
X Axis = Time
Y Axis = Voltage



Economic benefits of having ERT installed

LOE %	20%
WTI	40
Events per month	1
Labor and other costs per event	100
Downtime hours per event	2
Monthly BOEPD	20,500

The numbers presented in the table below are related to the event experienced on the 9th of September. One thunderstorm cost thirteen wells between 2 and 6 hours of downtime. Had ERT been installed on each well, a total of 1524bbls deferred production would have been prevented, netting a saving of $60,960.00. If Superior 115H only experienced one shut down event per month, on an annual basis, the client would save $11,079. In addition to this savings, ERT extends the life of ESP's by reducing the stress induced due to constant shut downs and restarts. The economics presented here are based on Power Sentrys Hardware as a Service (HaaS) model which allows customers to pay on a 'per event' basis.

	Without ERT			With ERT		
Lease	Gross **Monthly** Revenue Lost	**Monthly** Labor and other costs incurred per event	**Monthly** Gross Profit lost	ERT **Monthly** Cost ($500 base plus $399 per event)	Net **Monthly** Savings after ERT Cost	Net **Annual** Savings post ERT Cost
Lease Example	2,278	100	1,722	899	923	11,079

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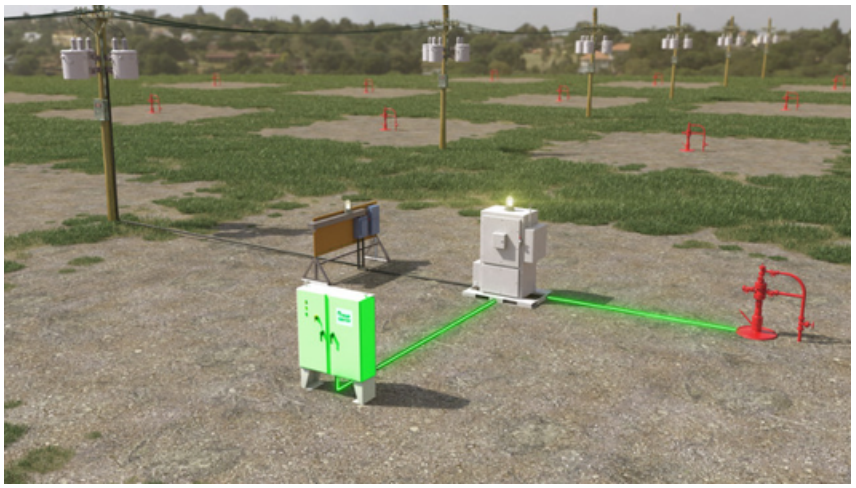
ERT Overview

NEMA 3R

Stable power in the oilfield is uncommon. Brown out's, sags and complete outages are an inevitable consequence of bad weather and overloaded grids. Power Sentry has developed a solution that provides supplementary power during power disturbances. Our patented Electrical Ride-Through (ERT) technology allows operations to avoid the negative impact of power fluctuations on production systems utilizing Variable Speed Drives (VSD). The Power Sentry ERT system is an industry leader when weighed against its competition. Our systems superior performance will maintain a VSD's operation where others fail. At Power Sentry, we don't measure our ability in milliseconds, we quantify success in seconds.



Capability Matrix

ERT CAPABILITY MATRIX							
System	HP	Voltage (AC)	VSD Voltage Trip Point	FLA	Ride-Through per Load Level (seconds)		
					100%	75%	50%
ERT-300	125	480	350	156	4.72	6.29	9.44
	150			196	3.93	5.25	7.87
	200			241	2.95	3.93	5.90
ERT-400	125	480	350	156	17.31	23.08	34.62
	150			196	14.43	19.23	28.85
	200			241	10.82	14.43	21.64
	250			313	8.66	11.54	17.31
	350			469	6.18	8.24	12.36
ERT-500	350	480	350	469	12.36	16.49	24.73
	450			546	9.62	12.82	19.23
	500			623	8.66	11.54	17.31
	600			690	7.21	9.62	14.43
	800			840	5.41	7.21	10.82

Features

- ERT is also built with an over voltage protection designed to save the VSD and its components when input line voltage spikes.
- ERT can support more than one VSD lending to the already stellar economics associated with having one installed
- Customers have the ability to access real time data and ERT performance through the Samsara remote monitoring platform.

About Power Sentry

technology loe opex esg saving power utility reduction

Power Sentry is an industry leader in providing innovative solutions for power management. We are passionate about delivering technology that serves the dual purpose of reducing operating expense and improving ESG outcomes for our clients.

Power Sentry is in proud partnership with CSL Capital Management, a Houston-based private equity firm specializing in energy services, equipment, and technology.

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