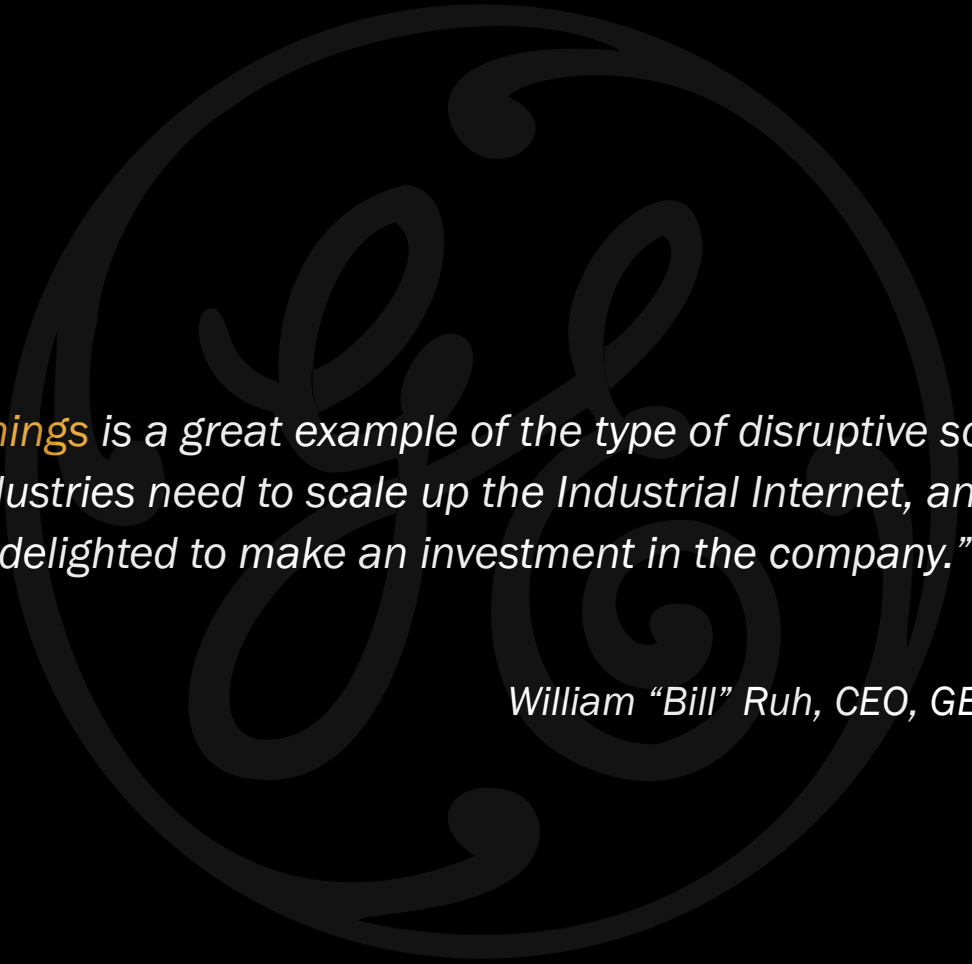


PingThings

PredictiveGrid:GIC

PingThings

is a software company specializing in “Big Data” analytics. We bring advanced data science and machine learning to the electric utility industry. PingThings has built the first internet scale, realtime stream analysis engine with applications for high frequency sensor data received from phasor measurement units (PMUs). We analyze this data in conjunction with data from external systems which provides unparalleled situational awareness of the power system to its operators.

A large, faint, dark gray watermark of the GE logo is centered in the background of the slide. It consists of a circle with a stylized 'E' inside.

“PingThings is a great example of the type of disruptive software that industries need to scale up the Industrial Internet, and we’re delighted to make an investment in the company.”

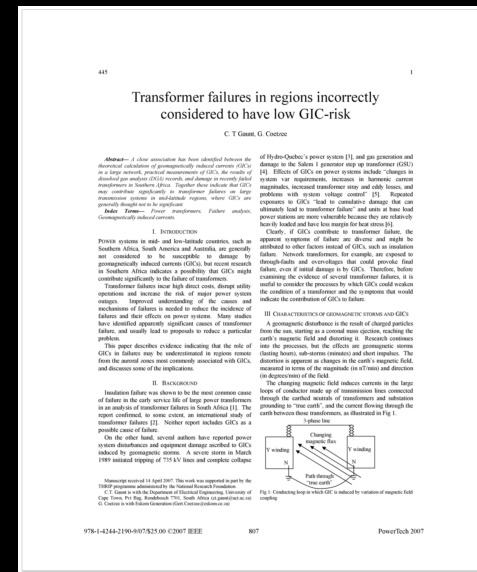
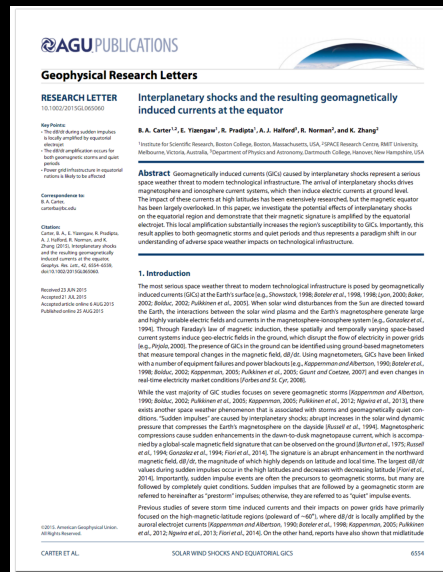
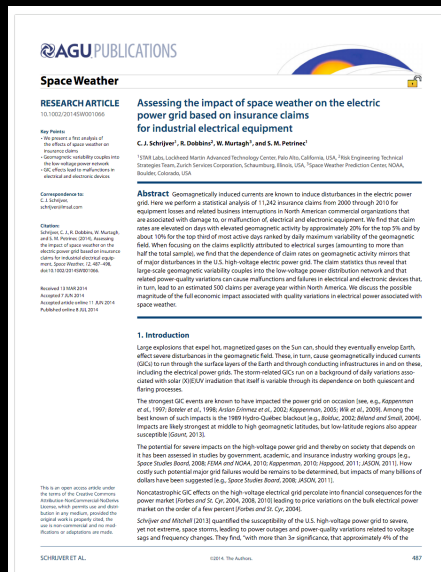
William “Bill” Ruh, CEO, GE Digital

RELIABILITY VIA WIDE AREA SITUATIONAL AWARENESS

- 348 million dollar investment by DoE and industry to bolster reliability.
- PMU as primary grid sensor, deployments are growing exponentially in North America.
- 30-240 samples per second with varying payload sizes
- Tracks time synched voltage and current phasors including angle and magnitude



GIC IMPACTS LIMITED TO HIGH VOLTAGE EQUIPMENT HIGHER MAGNETIC LATITUDES ONLY REGIONS AT RISK GMD'S ONLY OCCUR DURING STORMS RELATED EQUIPMENT DAMAGE IS IMMEDIATE



*“Even if we disregard the uncertain impact of extreme space weather, we know that impacts of moderate to extreme space storms that occur a few hundred times per 11-year solar cycle have consequences that merit substantial attention and investment. One study of the overall cost to the US economy alone of non-catastrophic disturbances in the US power grid attributable to geomagnetically induced currents suggests that the impacts may be as large as **US\$5–10 billion/year**”*

Assessing the impact of space weather on the electric power grid based on insurance claims for industrial electrical equipment
Schrijver C.J., Dobbins R., Murtagh W., Petrinec S.M.
(2014) Space Weather, 12 (7) , pp. 487-498.

EXPONENTIAL THREAT VECTORS

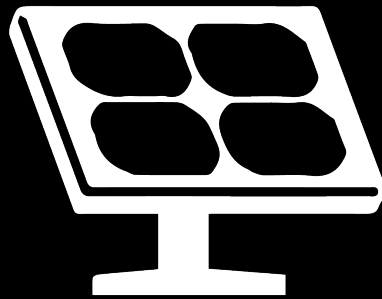
NATURAL PHENOMENA VS. MAN MADE



Geomagnetic



Distributed Generation

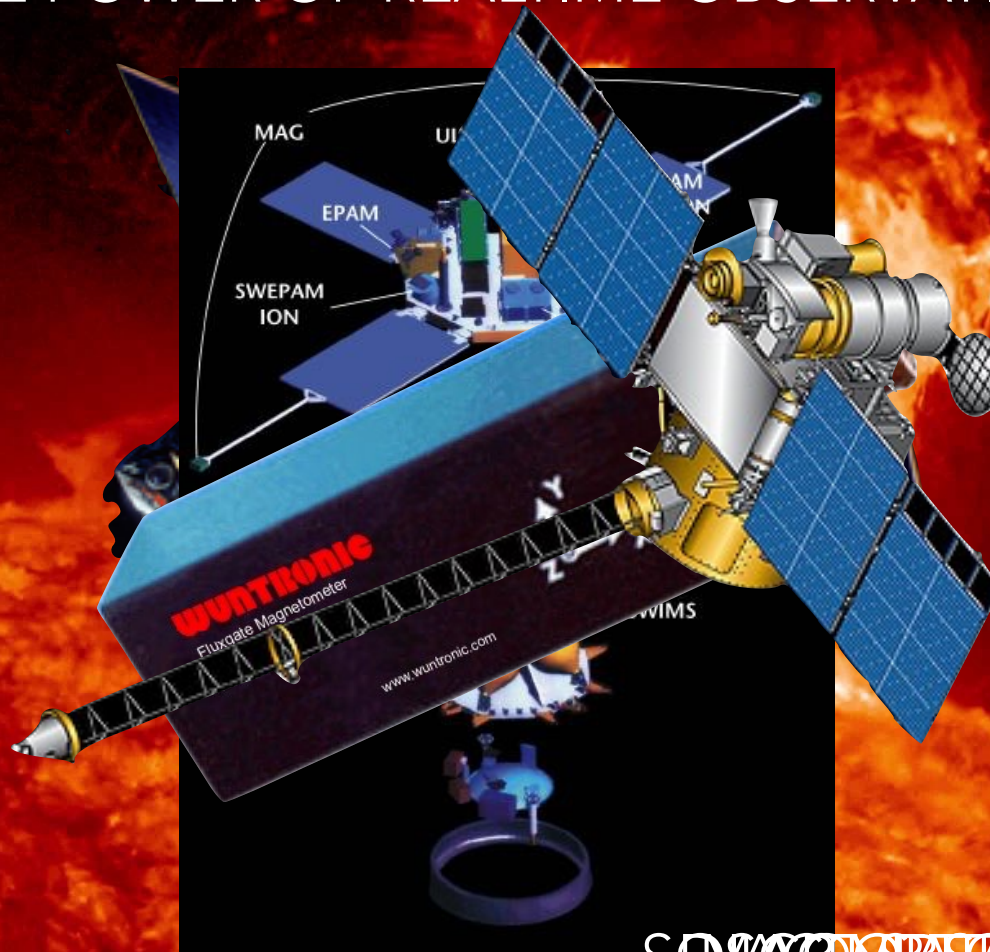


Weather



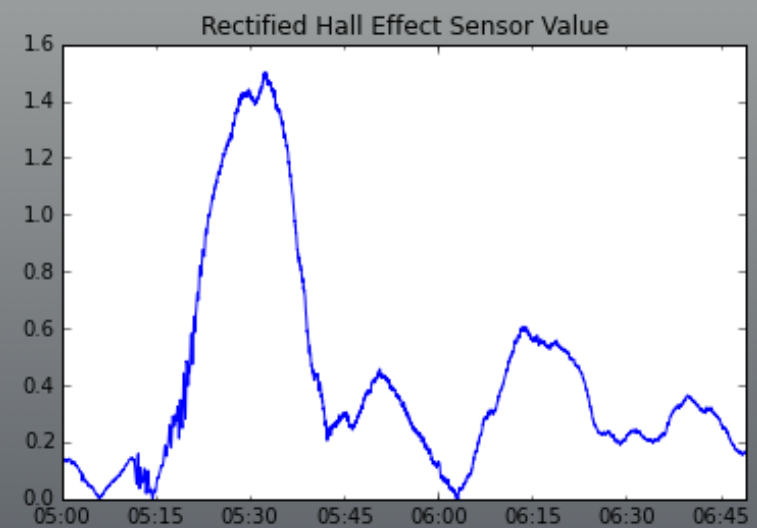
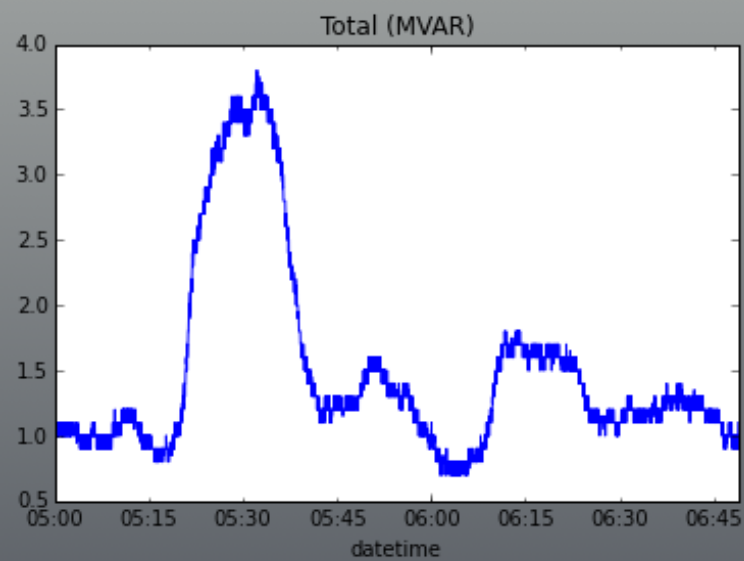
Cybersecurity

THE POWER OF REALTIME OBSERVATION



SOON TO BE A REALITY

SIGNALS



October 8, 2015 at Central Maine Power

“MEASUREMENT IS THE FIRST STEP
THAT LEADS TO CONTROL AND
EVENTUALLY TO IMPROVEMENT

IF YOU CAN'T MEASURE SOMETHING,
YOU CAN'T UNDERSTAND IT

IF YOU CAN'T UNDERSTAND IT, YOU
CAN'T CONTROL IT

**IF YOU CAN'T CONTROL IT, YOU CAN'T
IMPROVE IT.”**

—H. JAMES HARRINGTON



Ping**Things**