NEW ERA TECHNOLOGY, INC.

The Complete Aerial Surveying, Remote Sensing, and Reporting Solution for the Oil, Gas, and Product Energy Sector

Volume 1, Issue 3 **December 2019**

From the Desk of the President

Future of Leak Indication Technology

The one constant in business and technology is change. Over the past years the rate of change in technology has increased to an incredible rate. Unfortunately, we have seen changes in technology hailed as the latest, greatest and cutting edge that failed to live up to the press clippings. We have seen technology go from first to worst in a very short time in some industries because the press of time to accomplish innovation in record time has led to shortcuts in qualification and testing then releasing into the marketplace products that fail.

As has been reported in previous newsletters New Era Technology, Inc is developing what we believe to be the most advanced technology for aerial leak indications that will become the industry standard. The advantage of this new development is that it will be capable of being installed in a helicopter or in multiple fixed wing aircraft. In addition, not only will be accuracy of the equipment be improved, but the ability to put it into the fixed wing this technology becomes affordable for all types of natural gas transmission lines.

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Inside This Issue

Update from the Customer Solutions Group

Public Perception of the Oil & Gas Industry – Helping to Make It Right

Whether discussing upstream, midstream, or downstream sectors, frequently you hear of the general public's (also read "voters") poor perception of our oil and gas industry. Within the industry's own shows, conferences and journals you hear and read of counties, cities, and even states suggesting moving toward "grandfathering natural gas customers", eliminating the carbon energy option to the consumer, and or "creating zone free pipeline areas" because of the public's distrust due to perceived minimal regard that the industry has toward public safety and the environment. It's important to recognize that no matter what the truth may be, perception is reality, and this really isn't news to any of us.

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Notes from the Scientific Laboratory

Remote Sensing

Remote sensing is the measurement of properties of an object from a distance (i.e. without coming into physical contact). In modern usage, the term is typically applied to satellite and/or aircraft-based measurements, and is used in many earth science disciplines to measure the land, oceans, atmosphere, and beyond.

Remote Sensing measures the physical properties of an object by measuring the interactions of the object with an electromagnetic (EM) field, such as visible light, infrared, ultraviolet, radio waves, etc. These interactions include reflection, absorption, and emission of EM radiation. Over much of the last few decades, leak indication has been performed using instruments known as Flame Ionization Detectors (FID). These are hand held (or backpack) devices that "suck" a sample of air into the device and

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Although we would like to have the development done in record time, we don't want to fall victim to the failures that we have observed in other industries as companies try to rush to market with a new technology. Instead of rushing, we have chosen the following path:

1. An extended design phase with each step receiving several reviews by each of the disciplines involved in the process.
2. Once a design has been tentatively agreed to by the various disciplines it is then submitted for analysis by an outside third party for potential pitfalls.
3. Once any identified potential difficulties are resolved, it is resubmitted for further analysis to ensure the potential risks have been resolved.
4. Prior to the first prototype being assembled each of the subsystems will be assembled and tested to be assured they are functioning as expected.
5. Once all subsystems are qualified then the complete prototype unit will be assembled and tested.
6. After the completed unit has passed the laboratory testing it will then be installed in the test aircraft for trial under real world conditions. Many a product has tested well in the laboratory, but failed under real world conditions.
7. Once New Era has proven that the unit meets the expectations of the industry as we see them, the unit will be taken for the tests at METEC.

We are currently working on step 4 of the development process. We expect that after the holidays the testing of the individual systems will begin and expect that part of the testing to move very rapidly considering all the individual component work that has already been completed.

In this issue of the newsletter we are including some background information on remote sensing and will have more in future newsletters. This document is the first installment of several educational documents that will be included in the future newsletters.

In the March newsletter we should be able to give some target dates for the completion of the new unit. We do recognize that "Murphy" is alive and well when a new technology is being developed, but we are hoping to be able to keep him locked up and out of trouble.

Notes from the Laboratory

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determine the presence of hydrocarbons in the sample. These instruments do not differentiate between hydrocarbon species. The result is usually expressed in parts per million (ppm), and these are the units most familiar to in-field pipeline operators. However, remote sensing instruments measure the actual amount of gas between the instrument and the ground (aerial), or between the instrument and a remote reflective surface (ground based). The data provided by remote sensing instruments are usually expressed in parts per million per meter (ppm-m).

Comparing the capabilities or sensitivities of a sampling instrument to a remote sensing instrument is a bit like comparing apples to oranges. The units of the measurements are different. However, this has not stopped many remote sensing service providers from using some very strained (and often disingenuous) logic to describe the capabilities of remote sensing instruments in fractional units. Since most non-technical people understand gas concentrations in ppm, some remote sensing companies will express their sensitivity as if the gas was spread evenly over the entire path of the measurement. For example, if an airborne remote sensing gas measurement has a minimum sensitivity of 1,000 ppm-m and flies at 100 m altitude, the company might express its minimum sensitivity as 5 ppm. This is because 5 ppm of the gas spread evenly over the entire 100 m long path between the aircraft and the ground (2 passes, down then up) will result in 1,000 ppm-m of gas along the indication path. In reality, if the gas is leaked from a pipeline, it will be located only in a very narrow segment of the path, at much higher concentration. This logic is most egregious in some "fence-top" systems that may have greater than 1 km path lengths. DIAL systems are notorious for employing this tortured logic.

The primary defense against pipeline leaks by all pipeline companies is automated measurements of pressure and flow rates along the pipelines. Any unexpected change in these values can indicate a leak in the pipeline. These systems, however, can typically only reliably detect sudden leaks of 1% to 3% of the flow rate in the case of liquids, and 8% to 12% of the flow rate in the case of gas.

Given the high cost of remediation and potential litigation after leaks, and an increasingly stringent regulatory environment, there is a desire in the industry for technologies to sense smaller leaks in their pipeline infrastructure. Also the highly distributed nature of pipelines makes airborne remote sensing an obvious choice for pipeline leak indication.

New Era Aircraft

The current fleet of aircraft for New Era consists of Cessna 206, Cessna 182, Cessna 172 and Symphony 160. The company is looking to add two more Symphony 160 aircraft to the fleet later this year.

Cessna 206

Symphony 160

With the expected success of the new sensor in 2020 New Era will be adding aviation partners to accommodate the expected growth and demand for the leak indication that will come in the United States and Canada.

Helicopter option where it is most economical for the client.

From the Customer Solutions Group

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Helping to make it right:

This coming year (mid to late spring 2020) New Era Technology Inc (NETI) will do its part to provide stakeholders across the oil and gas industry with a remote sensing means to enhance the public's perception of our industry's true concerns for the environment and for the public's safety via Sentinel v.3 technology. This technology will greatly improve efforts to locate fugitive emission sources of ethane (from crude and product) and of methane (from natural gas). NETI's v.3 remote sensing radiometric gas filtered Sentinel sensor enhances the public's safety, and protects the environment across the industry's extremely large geographic footprint from production fields, to gathering systems, and even further across transmission pipeline systems that encompass large populations as well as pristine countryside.

Your company can associate with, and participate in, the v.3 Sentinel Sensor test initiative by sharing with us issues and concerns that you would like for the tests to address regarding locating fugitive emissions and/or by test observation and/or by reviewing test results. Tests will be conducted by experts at Colorado State University's Energy Institute METEC testing facility in Fort Collins (recognized by the O&G industry's One Future Coalition promoting the industry's voluntary reduction of fugitive emissions).

Those participating-in-test-preparation and/or participating-in-test-observation and/or simply receive test results are encouraged to use the event participation and results as a reference in your public relations efforts helping to rectify the public's poor perception of our oil and gas industry.

To participate in test preparation and/or to observe testing and/or to simply receive test results please contact Randy Burkham before January 30th 2020 (email: rburkham@neweratechinc.com or call 713-444-4103).

For your comfort and safety there will be a limit to the number of people that will be allowed to observe at the Fort Collins test facility

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FUTURE NEWSLETTERS

Issue Dates:

March 2020
June 2020
September 2020
December 2020

Future contents:

Progress reports on sensor development
Details on navigation system
Business Updates
Technical Updates
Who's Who at New Era