

Testimony of
Jim White

On Behalf of the International Association of Geophysical Contractors

Oversight Hearing on
“The Fundamental Role of Safe Seismic Surveying in OCS Energy Exploration
and Development”

Before the U.S. House of Representatives
Committee on Natural Resources
Subcommittee on Energy and Mineral Resources

July 14, 2015

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ARKeX**

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To Chairman Lamborn, Ranking Member Lowenthal and Members of the Subcommittee:

Good Morning. I appreciate the opportunity to be here today to discuss the role of safe geophysical surveying in the exploration of the outer continental shelf energy, and specifically in the Atlantic.

My name is Jim White, and I am President of ARKeX, a non-seismic geophysical company. We provide multi-client and proprietary geophysical data and integrated workflows to oil and gas exploration and production (E&P) companies in the United States and worldwide. We are headquartered in Cambridge, UK with offices in Houston and Australia. ARKeX is a member of the International Association of Geophysical Contractors (IAGC), the trade association of the global geophysical industry and the International Airborne Geophysics Safety Association. I would like to thank the Subcommittee on Energy and Mineral Resources for the opportunity to testify at this oversight hearing regarding “The Fundamental Role of Safe Seismic Surveying in OCS Energy Exploration and Development.”

We are pleased that Congress continues to look into this important matter that will provide for the nation’s continued progress toward energy independence, economic vitality and energy security. It is now time for us to move forward and take the first step in determining the resource potential of the Atlantic OCS by allowing geophysical surveys to get underway. It has been over a year since the Bureau of Ocean Energy Management (BOEM) released its Record of Decision (ROD) authorizing permitting of geophysical activities on the Atlantic OCS.

Seismic and other geophysical surveys have been safely conducted in the U.S. and around the globe for over 50 years. These geophysical surveys are the critical first step to better understanding the resource base of the Atlantic OCS and providing policy makers and regulators with the information they need to make informed decisions about oil and gas development based on the best available data. Surveys do not necessarily lead to oil and gas development. In fact, surveys determine both areas that are *and are not* likely to have recoverable oil and gas resources. However, unless the surveys can commence, that information will never be available to policy makers and the public.

Today, my comments will focus on the key role of geophysical surveys in determining the resource potential, the safety of our technology and the difficult process of obtaining permits to perform geophysical surveys of the Mid- and South Atlantic OCS.

I would first like to give a description of my company, ARKeX and our technology. ARKeX acquires non-seismic geophysical data using Full Tensor Gravity Gradiometry, also known as FTG and licenses these products to oil and gas companies. We also provide the same products to the BOEM for its use in evaluating the OCS resource base, ensuring it receives fair market value when it leases OCS lands, and makes the many conservation decisions required of the Bureau as it administers its obligations under the OCS Lands Act.

I have mentioned non-seismic surveys a few times. It is important to note that the geophysical surveying that would take place in the Atlantic OCS is not only seismic, which utilizes an acoustic energy source, but non-seismic as well. ARKeX's FTG survey data will be acquired from a fixed-wing aircraft with no at-sea activities and no component of the survey being within federal or state waters. The FTG surveys measures minute variations in the Earth's gravitational field. There is no sound source associated with gravity or magnetic surveys.

It should be noted that our flight paths and flight heights are generally the same as those planes that fly advertisement banners daily along the Atlantic coastline. A typical survey acquisition grid is similar to marine seismic surveys, generally with flight-line spacing of 0.5 – 3.0 kilometers. Surveys of 500 square kilometers can be completed in a few hours. The objectives of the survey (such as the amount of area to be covered, the desired detail to be obtained, etc.) and the cost determine three of the most important factors to be specified for any given survey: (1) the altitude at which the survey will be conducted; (2) the flight-line separation; and (3) the flight-line orientation, or direction. Similar surveys were recently completed offshore Greenland and offshore Honduras.

By combining the broadband gravity data from an FTG survey with existing subsurface knowledge, geologists can improve the confidence in their geological model and more accurately target oil, gas and mineral deposits. FTG is a complement to seismic surveys and does not replace seismic. Our data is used in conjunction with seismic data to provide an improved interpretation and can also act as a stand-alone service that is often used in frontier areas to effectively place seismic programs for a better understanding of the resource potential.

Why new seismic is needed for the Mid- and South Atlantic OCS

There is no question that geophysical surveys are greatly needed in the Atlantic. It has been nearly 40 years since geological & geophysical (G&G) surveys were conducted in Atlantic waters. BOEM currently estimates that the Mid- and South Atlantic OCS contains at least 4.7 billion barrels of oil and 37.5 trillion cubic feet of natural gas. These estimates are impressive, but it is widely believed that modern seismic imaging using the latest technology will show much greater resources than the 40-year-old estimates. Geologists and geophysicists believe that the Atlantic OCS could have much more abundant oil and gas resources than we previously

believed based on the hydrocarbon productivity of the Atlantic Margin in areas like West Africa, Brazil and Nova Scotia. Thus, current estimates are outdated and, in all likelihood, grossly inaccurate.

When BOEM released its draft Five-Year Plan for offshore oil and gas leasing in January of this year, Secretary Jewell stated interest in “learning more about the resource potential” in the Atlantic OCS. Modern geophysical imaging is the only feasible technology available to make this evaluation. The industry’s array of new tools—reflection, gravity, magnetics, electromagnetic—can better help us understand the potential resource.

Today, geophysical surveys use modern data acquisition and data processing techniques using massive computing power to produce sub-surface images which are much detailed and more accurate than those from decades ago, or even five years ago. Better information enables the government’s evaluation of the potential resource base as well as for prospecting for oil and natural gas reserves offshore.

We know from experience that exploration and development activities generally lead to increased resource estimates. In 1987, the Minerals Management Service estimated only 9.57 billion barrels of oil in the Gulf of Mexico. With more recent geophysical data acquisition and additional exploratory drilling, that estimate rose in 2011 to 48.4 billion barrels of oil — a 500 percent increase.

Benefits of G&G Surveys

The benefits of modern geophysical surveys are numerous from environmental to economic. They make offshore energy production safer and more efficient by greatly reducing the drilling of “dry holes” (where no oil or gas is found). Because survey activities are temporary and transitory, it is the safest and least intrusive and also the most cost-effective way to understand where recoverable oil and gas resources are likely exist in the Mid- and South Atlantic OCS. Additionally, it is expected that initial surveys will be non-exclusive or multi-client, meaning they would be shared by all E&P companies. The data gathered in a one-time process can be used again and again.

For the energy industry, modern geophysical imaging provides greater certainty by increasing the likelihood that exploratory wells will successfully tap hydrocarbons and helping avoid drilling for oil and gas in areas where we won’t likely be successful. It reduces the number of wells that need to be drilled in a given area, therefore reducing the overall footprint for exploration.

In addition to modern survey techniques, another key technological advancement has come with the help of the computing industry. This industry has helped to spur marked advancements in computing not only for the oil and gas industry but for society as a whole. The development of more powerful computers at diminishing prices allowed us to further leverage new acquisition tools. Ever greater computing power freed the creativity and innovation of data processing professionals to develop increasingly complex algorithms that address the vast number of

challenges offered by the complex earth. And these complex algorithms are now being applied against an ever expanding number of data points.

With substantially larger amounts of data, and with more complex processing techniques that are run on increasingly more powerful computers, we are now able to identify with accuracy drilling targets the size of a parking lot three miles deep into the earth (and sometimes through a mile of water!). This enables the drilling engineers to do what they do best – hit those targets.

This industry is also applying these new techniques in older producing areas – areas that are known to generate and trap oil and gas. We are able to use the fine scale resolution offered by today's imaging techniques to find reserves that went unseen using the older techniques. Additionally, to maximize production from existing reservoirs, another dimension in technology – 4D – has been introduced. By acquiring 3D at the same location repeatedly, it is now possible to have a motion picture visualizing the behavior and evolution of fluids in the reservoir as it is produced.

Atlantic Permitting Process Challenges

Whether in private business or government, the best decisions are generally made when we have the best available data. This is true of our nation's oil and gas resources. It only makes sense for us to understand the resource base and its value.

It is very important to note that G&G activities under consideration in the Atlantic OCS will not only be used to identify potential oil and gas resources, but also to identify suitable areas to place offshore renewable energy facilities. Geophysical surveys enable our nation to reach its full energy potential by truly using an “all-of-the-above” approach.

ARKeX applied for our permit in June of last year. Since that time, we have done our part to properly inform and educate various state and federal agencies through numerous meetings and presentations. We have completed every public and environmental review, state consistency determination, and condition necessary to obtaining our permit. We have reviewed and addressed every mitigation measure recommended by BOEM, NOAA Fisheries, the Department of Defense, the Department of the Navy, State Coastal Management Offices, and the National Aeronautics and Space Administration (NASA).

To our knowledge, every agency has approved and signed off on our permit and our plane is sitting in North Carolina ready to commence operations, awaiting the administration's final approval.

Geophysical Survey Safety and Environmental Responsibility

There is no evidence that sound from geophysical acquisition activities is harmful to marine life. The geophysical industry operates in every region of the world and works very closely with local governments to ensure that geophysical operations do not disturb local marine life and coastal communities. Experience shows that geophysical survey activities, tourism, fisheries, and

marine life can and do coexist successfully.¹ Despite recent statements by critics who oppose opening up the Atlantic OCS to oil and gas exploration, the geophysical industry has demonstrated for over 50 years its ability to operate seismic exploration activities in an environmentally safe and responsible manner that protects marine life.

The Federal government affirms that sound from geophysical surveys has not been found to be injurious to marine life. In the March 4, 2014, publication of the Federal Register, the National Marine Fisheries Service (NMFS), stated the following (section 6): “To date, there is no evidence that serious injury, death or stranding by marine mammals *can* occur from exposure to airgun pulses, even in the case of large airgun arrays.” (NOAA - National Marine Fisheries Service, Federal Register Notice March 4, 2014 -Vol. 79, No. 42, Page 12166).

Additionally, the BOEM substantiates the NMFS statement in its August 22, 2014 Science Notes. In the publication, the BOEM states, “To date, there has been no documented scientific evidence of noise from air guns used in geological and geophysical (G&G) seismic activities adversely affecting marine animal populations or coastal communities. This technology has been used for more than 30 years around the world. It is still used in U.S. waters off of the Gulf of Mexico with no known detrimental impact to marine animal populations or to commercial fishing.” The BOEM affirmed this fact in its March 9, 2015 Science Notes.

The geophysical industry takes a great deal of care and consideration of potential impacts to the marine environment. Despite the lack of evidence that geophysical surveys pose a danger to marine life and because this is a priority, we implement mitigation measures to further reduce any potential impacts to marine mammals. Examples include the avoidance of important feeding and breeding areas, demarcation of exclusion zones around seismic operations, soft starts (gradual ramping up of a seismic sound source), and visual and acoustic monitoring by professionally trained marine mammal observers. Any activity in the Atlantic would be done with at least the same care and consideration for marine life.

The geophysical industry continues to support scientific research by investing millions of dollars to fill any knowledge gaps that may exist in knowing how marine life interrelates to seismic and other geophysical operations. Research studies and operations monitoring programs designed to assess the potential impacts from seismic surveys have not demonstrated biologically significant adverse impacts on marine mammal populations. Industry continually monitors the effectiveness of the mitigation strategies it employs and funds research to better understand interactions between E&P operations and marine mammals.

Conclusion

Now is the time for the nation to take the necessary steps toward continued energy security and independence by allowing geophysical surveys to get underway in the mid- and south Atlantic

¹ See, e.g., BOEM, *Final EIS for Gulf of Mexico OCS Oil and Gas Eastern Planning Area Lease Sales 225 and 226*, at 2-22 (2013) (“Within the [Gulf of Mexico Central Planning Area], which is directly adjacent to the [Eastern Planning Area], there is a long-standing and well-developed OCS program (more than 50 years); there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations.”).

OCS. We must equip our decision makers with the necessary information they need to make sound decisions regarding the future of oil and gas leasing in the Atlantic. Americans deserve public policy decisions that are made based on the best information possible, and modern geophysical surveys provide that data.

If the Administration includes the Atlantic OCS in the next five-year lease plan and, based on the geophysical data collected by our industry, lease bids are made, the geophysical industry will play another critical role in providing the information necessary to safely and accurately explore and develop these vital resources.

I hope this information is useful to your understanding the key role of geophysical surveys for the Atlantic OCS. Thank you for your time and attention today. I look forward to any questions you may have. IAGC and I are at your disposal if we can be of further service. I appreciate the opportunity to testify before the Subcommittee.