ENERGEO ALLIANCE | South Africa

From conventional energy sources to groundbreaking new energy solutions, the energy geoscience industry is vital to energy development. The industry uses earth science and data to help discover, develop, and deliver energy to people around the world. We are focused on making energy exploration and the advancement of energy solutions safer and cheaper by improving locating and qualifying resources, combined with better understanding energy and environmental systems.

What is geoscience and what is it used for?

- The energy geoscience industry has been active for over a century. Geoscience uses data and science to responsibly study the earth to precisely discover energy resources. From the most conventional forms of energy to groundbreaking new solutions, securing energy sources in South Africa cannot exist without it.
- The technology, which includes seismic surveys, can pinpoint the areas with the most potential for mainstay energy, such as oil and natural gas, or alternative energy, making it faster, safer and more environmentally effective when undertaking energy discovery and project siting.

What are seismic surveys?

- Seismic surveys use low-frequency sound waves to map the seabed. The technology is similar to ultrasound technology, which is commonly used in medicine for imaging the human body.
- Seismic surveys can be conducted on land and in the ocean, without disrupting their ecosystems. The oil and gas industry uses both types of surveys to determine where hydrocarbon reserves are on land and in the sea.
- Seismic technology has been used extensively in South Africa for decades and is a well understood and safe industry practice.

Are seismic surveys a new form of technology?

- Seismic technology has been in use since the early 1900s to measure water depths. Seismic surveys have been used for more than eight decades, starting in 1937 in the U.S. Gulf of Mexico.

Why does the oil and gas industry need to conduct seismic surveys?

- Without using data, science, and technology, it is impossible to estimate South Africa's natural energy reserves. Our industry provides the teams, engineering, and data solutions that are critical for exploration and production activities across the energy sector.
- Seismic surveys conducted in South Africa for decades have confirmed that South Africa has its own energy sources that can be reliably and affordably developed, unlocking energy independence for the country and her citizens.

Do seismic surveys pose a risk to marine life?

- The surveys are generally considered not to be harmful or damaging to the marine environment. They are comparable to many naturally occurring ocean sound sources, temporary and transitory, and the vast majority are conducted at frequencies below the hearing range of many marine species.
- Despite extensive efforts to promote speculations about possible adverse impacts from seismic activities over the past 15-20 years, there is no scientific data to support that.
- While fish may temporarily swim away from the seismic air source, they often return after the vessel has left that area. To ensure the safety and economic viability of fishing operations, survey operators work with regulatory bodies and local fishing communities to avoid sensitive spawning areas.
- The energy geoscience industry doesn't just take this as a given, and our industry members have allocated millions of dollars to scientific studies which analyze the potential effects of geophysical surveying on our world's flora and fauna. We will continue to do this, globally and in South Africa.

What mitigation measures do we use to ensure we respect marine life?

- We have worked hard to develop mitigation measures with marine biologists and oceanographers, including marine mammal observers (MMOs) during all our surveys, and we respect all exclusion zones.
- Our members take this very seriously, and work hand in hand with marine biologists and oceanographers to ensure the timing or surveys avoids events of biological significance, including breeding areas and seasons, migration and foraging.
- Before a survey operation begins, visual monitoring is undertaken to check for the presence of marine mammals and other marine species within a specified precautionary, or exclusion zone, often using dedicated marine mammal observers (MMOs) or protected species observers (PSOs). Areas of concern for impacts on marine life are strictly off limits to testing vessels so that those populations and ecosystems are left undisturbed.
- Further monitoring may be done using passive acoustic monitoring technology (PAM), which may detect vocalizing marine animals, especially during low visibility and nighttime conditions. In the event marine animals are detected in the survey area, all activity ceases immediately and can only be restarted when the area is clear.
- "Soft start" or ramping-up procedures are undertaken by seismic vessels as a matter of general operational procedure to make sure that marine animals are given time to leave an offshore testing area. This involves activating a small section of the acoustic sound arrays to introduce the seismic activity and noise to marine species, gradually increasing.

Are the potential impacts on the environment considered before conducting a seismic survey?

- All seismic surveys conducted in South Africa are in full compliance of local and international environmental laws and regulations.
- **Environmental Impact Assessment**
  - Developing and implementing a geoscience survey requires the completion of an Environmental Impact Assessment (EIA).
  - An EIA considers the potential impact of a seismic survey on marine life and the ability of humans to use and enjoy the environment. An assessment typically includes: the identification of marine species, including protected species, other environmental sensitivities and the human uses of the proposed area of operations. These assessments are conducted during the survey planning stage and evaluate the potential impacts and risks to marine life. The assessments also identify and consider measures to avoid or mitigate such potential impacts and risks.
- Beyond our legal responsibilities to the oceans, our members are committed to keeping our oceans free of marine debris. Since 2016, EnerGeo Alliance members have reported removing more than 2.5 million pounds of marine debris around the globe. The industry has developed extensive water and solid waste recycling practices to avoid a negative impact on the ecosystems in which we operate.

Do seismic surveys pose a risk to marine life?

- The surveys are generally considered not to be harmful or damaging to the marine environment. They are comparable to many naturally occurring ocean sound sources, temporary and transitory, and the vast majority are conducted at frequencies below the hearing range of many marine species.
- Despite extensive efforts to promote speculations about possible adverse impacts from seismic activities over the past 15-20 years, there is no scientific data to support that.
- While fish may temporarily swim away from the seismic air source, they often return after the vessel has left that area. To ensure the safety and economic viability of fishing operations, survey operators work with regulatory bodies and local fishing communities to avoid sensitive spawning areas.
- The energy geoscience industry doesn't just take this as a given, and our industry members have allocated millions of dollars to scientific studies which analyze the potential effects of geophysical surveying on our world's flora and fauna. We will continue to do this, globally and in South Africa.