

3D Acquisition — Perils and Pitfalls

You are in the middle of your 3D seismic acquisition program and have more problems than you know what to do with! The environmentalists are upset that you are shooting in the bird sanctuary, the prison warden on whose grounds you are shooting over wants to go to a Saints game, and the permit agent has an individual who claims you have damaged ten of his seven foot marijuana plants valued at \$1000 each. The crew is standing by waiting on a permit that was overlooked and your injunction is going to take another eight days before you get a hearing. This was supposed to be a piece of cake! After all, everyone is shooting 3D. You never heard of these problems from anyone else! Is yours that unique or is it just that no one is talking about their problems and challenges? Now your partners are threatening to pull out if you cannot get this shot in the time frame you indicated. Geez, where is it all going to end? Oh, and by the way, you are over budget!

The advent of 3D seismic has created additional opportunities within the realms of hydrocarbon exploration and production. This new tool allows explorationists to delineate features which they otherwise would not find. However, as with any new technique, there is a learning curve and mistakes are going to be made. Depending on the individuals and the company, these errors can occur in the office while designing the 3D program or in the field during the many stages of acquiring your data set. Though modeling and formulas are an integral aspect of planning the 3D seismic acquisition program, field knowledge and expertise are the key elements between a successful and an unsuccessful 3D program.

Especially when you meet Billy Bob Jim Jack who owns two sections right in the middle of your prospect and he "just don't really want none of them seismographic people runnin' around on my place!" And Rincky Dink Oil

Company wants some data for free for a mineral permit. So, while our design looked great in the office when you planned it and presented it to management, it has now taken on a whole new picture, and not necessarily one for the better. How do you overcome this challenge?

While a poorly planned and executed 3D seismic acquisition program will result in dry holes and cost millions of dollars (as well as one's job), a successfully planned but poorly executed 3D program will have the same results. Incorrect control of such issues as mineral and surface permitting can result not only in an unusable survey, but it can also cost hundreds of thousands of dollars and bankrupt an exploration company. Companies must stay current on new federal and state regulations facing the industry or find themselves in a predicament that will take years of litigation to unravel.

And let's not forget the time necessary to execute each individual stage of the geophysical acquisition process. Oh, you mean the contractor didn't mention that the drills were on another job that has been getting rain for two weeks and can't get to yours for a couple of more weeks? Yes, they were promised, but hands are tied and there is nothing that can be done. Hmmm, imagine. Detailed coordination among all contractors, subcontractors and the company forms the cornerstone of a successfully completed 3D program.

Wow! You finally have the field acquisition complete! What do you mean the processor is running behind and can't get to yours right now?! They promised! Yes, but your 3D data was not there at the promised time. Well, you ran into unexpected circumstances, surely they can understand that! Yes, they do understand, but a huge international project came in that has a short fuse due to the timing of the bid round and your 3D will have to wait. Surely you, as a

business person, can understand that, right? Now your partners are really hot! Oh, by the way, you are getting calls from some of the landowners who are not happy about what you have done to their land and someone's "prize bull" broke his leg in one of your shotholes. And some of the permits were not paid, so you are also getting calls from other landowners. And you thought that just because the crew was out of the field, you were done with the 3D program. Remember that Murphy's Law applies more so to seismic acquisition than to almost any other component of the oilpatch.

No matter how detailed the planning appears in the 3D arena, a situation will in all probability occur that will affect the procedure utilized in acquiring the data, though not necessarily the data quality itself. Properly planned and properly executed 3D seismic acquisition programs are every exploration manager's dream, a geoscientist's reward, and a company's road to building success.

Biographical Sketch

Patrick Buckley began his geophysical career over 20 years ago as the youngest crew manager for Teledyne Exploration, supervising geophysical acquisition for Amoco

Production Company. He assisted their research department in developing several new geophysical techniques, as well as acquiring their first onshore 3D data set. He joined Seismic Exchange, Inc. in 1983 where his responsibilities included data acquisition in the Mid-Continent and West Texas regions. During his tenure, these regions were responsible with the gathering of over 2500 miles of geophysical data. He became the manager of geophysical speculative programs with Richardson Seismic Services/ Petroleum Information in the spring of 1991, where his responsibilities included the orientation and acquisition of geophysical projects. In 1993, he left to form Global Geophysical Experts, Inc., whose expertise consists of assisting companies in executing all aspects of geophysical data acquisition of both 2D and 3D seismic programs. Mr. Buckley has worked in both the domestic as well as the international arenas gathering high quality 2D and 3D seismic data. He is a member of SEG, OCGS, DGGS, and was the past chairman for the WTGS governmental affairs committee. □



Patrick Buckley