

Capital, Technology and Resulting Issues in Seismic Licensing

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Table of Contents

- I. INTRODUCTION: THE LEGAL ISSUES IN SEISMIC LICENSING ARE CREATED BY TECHNOLOGY AND ECONOMIC FORCES
 - A. Current issues in seismic licensing are driven by the following factors
 - B. Consequences of these factors include the following
 - C. Defining questions
 - D. Current form licensing agreements
 - E. Changes required to the model license
- II. COMPETITION FOR CAPITAL: THE INDUSTRY'S STRUGGLE
 - A. Seismic's Dismal Record
 - B. "New Economy" Competitor for Capital: Cisco Systems
 - C. El Paso/Coastal as proxy for oil and gas companies
 - D. Veritas as proxy for seismic service companies
- III. ADDING VALUE TO SEISMIC
- IV. STRUCTURE OF LICENSE AGREEMENTS
 - A. The four quadrants of information
 - B. Elements of a multi-client data use license

Airplanes are like seismic data.

Does an E&P company need to own an aircraft or just have access to an aircraft?

Does an E&P company need to own seismic data or just have access to seismic data?

Does an E&P company need a King Air or a 747?

Does an E&P company need 2-D seismic or multi-component 3-D seismic?

Is the difference between a King Air and a 747 one of technology or capital?

Is an E&P company's choice between 2-D seismic data and multi-component seismic data a technology decision or an allocation of capital decision?

I. INTRODUCTION: THE LEGAL ISSUES IN SEISMIC LICENSING ARE CREATED BY TECHNOLOGICAL AND ECONOMIC FORCES.

A. Current issues in seismic licensing are driven by the following factors:

1. Competition for capital.
2. The long term downward trend of the real commodity price for oil and gas.
3. Advances in information and communication technology.

B. Consequences of these factors include the following:

1. Relentless pressure for cost reduction.
2. Consolidation of the exploration and production industry resulting in fewer seismic end-users and a concentration of buying power.
3. Focus of the exploration and production industry on core competencies resulting in a shift in the risk of collecting and ownership of seismic data from the oil and gas companies to the seismic contractors.
4. The constant transfer of oil and gas properties.
5. The means of easily and quickly pirating millions of dollars worth of seismic data.
6. Consolidation of the seismic industry.

C. Defining questions.

1. Whether oil and gas company or seismic contractor, each company's objective is to profitably participate in the industry of finding, processing and moving oil and gas from the earth to the end-user.
2. Four fundamental questions define this topic:
 - 2.1 What data and services will most effectively boost an oil and gas company's success rate in exploration and production?
 - 2.2 What are the most efficient means of obtaining access to these data and services?
 - 2.3 What must an oil and gas company do to motivate third parties to participate in efficiently making this data available?
 - 2.4 What information creates a proprietary differentiator that must be kept from competitors?
3. Short answers to these questions follow:
 - 3.1 Today, three dimensional ("3-D") seismic data and the processing of that data are the data and services that most effectively boost success rates in exploration. The big question today is whether, in the future, time lapse ("4-D"), multi-component seismic data and data processing techniques will economically further increase the success rate of exploration and enable an increase in the percentage of hydrocarbons recovered from a reservoir.

3.2 Today, if available, licensing non-exclusive (“Multi-Client”) 3-D seismic data is the most efficient means of obtaining access to 3-D seismic data. If Multi-Client data is not available, hiring a seismic contractor to acquire the data on a proprietary basis remains an available but expensive option. Outsourcing the data processing is the most efficient means of obtaining access to the services.

3.3 Everyone must make money to stay in business. The seismic contractors must deliver quality data in areas of interest on time at an attractive price so that the oil and gas companies can make money. The oil and gas companies must pay enough to license the data to recover cost plus a return so that the seismic contractors can make money.

3.4 Seismic contractors must protect acquisition craft, processing techniques and data libraries from unauthorized (not compensated) use. Oil and gas companies must protect interpretations and production craft from unauthorized use.

D. Current form licensing agreements.

1. Attached is a copy of the International Association of Geophysical Contractor’s form seismic licensing agreement (“Model License”).
2. The Model License grants a license to the licensed company. Any employee of licensee is permitted to use the data.
3. Under the Model License the data may be loaded on an unlimited number of workstations.
4. Under the Model License the licensee may access the field tapes and may perform an unlimited number of processing procedures on the data.
5. Under the Model License there is no maintenance fee charged or maintenance service provided.
6. Under the Model License the licensee may use outside processing services and consultants.
7. Under the Model License, limited use of the data is authorized by licensee’s development partners.
8. The Model License is barely adequate today and requires updating in the near future to address technological and commercial changes.

E. Changes required to the model license.

1. The volume of seismic data has historically provided its own protection against piracy. A terabit contains a billion bits of data. Databases measured in terabits have been too expensive to move by means other than physical tape.

“bandwidth” refers to the speed of data transmission.

“bps” refers to a rate of data transmission measured in bits per second.

“Kbps” refers to a rate of data transmission measured in thousand bits per second.

“Mbps” refers to a rate of data transmission measured in million bits per second.

“Gbps” refers to a rate of data transmission measured in billion bits per second.

2. A standard business data line (“DS-0”) operates at 64Kbps. Today, ENRON Communications advertises the availability of a wired 2.5 Gbps OC-48 line. That 2.5 Gbps line can handle a terabit of data in 17 minutes.
3. Today, NSN Wireless offers a wireless transportable encrypted data transmission system that can move data at 5 Mbps. That 5Mbps can send, during a seismic shoot, a terabit of encrypted data from a remote field location in 56 hours.
4. The availability of bandwidth is eliminating protection of seismic data by volume alone. The Model License will need to address this technological change and the ease of piracy that it threatens.
5. Increases in computing power and advances in processing techniques lead to the reprocessing of raw data. This reprocessing eliminates license sales for future surveys that are implicit in the 3-D Multi-Client business model. There should be a reexamination of the Model License’s policy of throwing in without charge a license to the field tapes on Multi-Client data. Perhaps access to field tapes should become a separately licensed data product and service.
6. The huge amount of capital required on the part of the seismic contractors, and the reservoir specific production insights on the part of the operators, for multi-component and 4-D seismic should cause a careful examination of whether the 3-D Multi-Client business model, for which the Model License was developed, makes sense for multi-component and 4-D seismic data.

II. COMPETITION FOR CAPITAL: THE INDUSTRY’S STRUGGLE.

A. Seismic’s Dismal Record.*

1. Full Cycle Review. Consider the seismic industry’s performance from 1994 through 1999, a full cycle of good times and bad.
2. Cost of Capital. During this cycle the seismic industry’s weighted annual average cost of capital was 11.9%.
3. Return on Capital. During this same cycle the seismic industry’s annual average return on operating capital was 7.8%.
4. Negative Return on Capital. During this cycle the seismic industry lost an annual 4.1% on operating capital.
5. What is the Solution? Clearly, this negative return on capital cannot continue indefinitely. The seismic industry’s obvious answer is that the oil and gas companies must bail out the seismic industry through higher prices. Oil and gas companies have their own return on capital issues. The oil and gas companies’ obvious response is that greater value must be delivered to justify higher prices.

* Source: Simmons & Company International, Oil Service Industry Research, October 4, 2000.

B. “New Economy” Competitor for Capital: Cisco Systems.

1. Share price. \$63.19 on August 15, 2000.

2. Market capitalization. \$453 billion on August 15, 2000.
3. Price/earnings ratio. 175.5 on August 15, 2000.
4. Earnings per share. \$0.36 on August 15, 2000.
5. Annual Sales for Year Ended July 29, 2000. \$18.93 billion
6. Annual Net Income for Year Ended July 29, 2000. \$2.67 billion.
7. Shareholder's Equity for Year Ended July 29, 2000. \$14.7 billion.

C. El Paso/Coastal as proxy for oil and gas companies.

The combined El Paso/Coastal will be an integrated energy company. The following numbers combine El Paso and Coastal for 1999.

1. 1999 Operating Revenues: \$18.778 billion (about the same as Cisco's).
2. 1999 Net Income: \$920 million (31% of Cisco's).
3. Book Value of Assets: \$31.780 billion.
4. Shareholders' equity: \$6.841 billion (46% of Cisco's).
5. Market Capitalization: \$18.5 billion (4% of Cisco's).
6. How can Cisco have a market capitalization almost 25 times in excess of the combined El Paso/Coastal?
7. What is an oil and gas company supposed to do to compete with Cisco for investment dollars?

D. Veritas as proxy for seismic service companies.

1. Veritas DGC, Inc. ("Veritas") is a large seismic contractor. Veritas is only in the seismic business and is not a division of a major integrated service company. Veritas' financial status gives us insight into the problems of seismic contractors competing for capital.
 - a. 1999 Revenues: \$388.9 million
 - b. 1999 Net income: \$20.3 million
 - c. Shareholders equity: \$315.6 million
 - d. Market capitalization: \$0.662 billion (.0015 of Cisco's)
2. August 15, 2000 Share Price: \$24.75
3. Earnings per share: \$0.15 (42% of Cisco's)
4. How can Cisco have a market capitalization more than 684 times in excess of Veritas?
5. What is a seismic company supposed to do to compete with Cisco for investment

dollars?

III. ADDING VALUE TO SEISMIC.

1. Multi-component. Capturing the shear wave as well as the pressure wave may add value to seismic data. Today, capturing and processing both the shear wave and pressure wave is difficult and expensive. There currently is no consensus among oil and gas companies that multi-component data will deliver a greater value justifying a higher price than conventional 3-D data. Absent enthusiastic support from paying customers, developing multi-component data techniques is a high risk undertaking for seismic companies.
2. Four D. Capturing and comparing data with a time lapse may add value to seismic data. Today, 4-D is difficult and expensive. There currently is no consensus among oil and gas companies that 4-D data will deliver a greater value justifying a higher price than conventional 3-D data. Absent enthusiastic support from paying customers, developing 4-D data techniques is a high risk undertaking for seismic companies.
3. Time Value of Money. Consider a hypothetical oil and gas prospect that requires \$100,000,000 of up front capital investment to yield , net of costs, \$5,000,000 per month for five years. Assume that our hypothetical exploration company has a 10% annual average cost of capital.

Month Cash

1-10 -\$10,000,000 per month

11-22 0

23-83 +\$5,000,000 per month

Net Present Value: \$100,493,940

Now assume that the seismic company can shorten the cash flow cycle on that same project by six months:

Month Cash

1-10 -\$10,000,000 per month

11-16 0

17-76 +\$5,000,000 per month

Net Present Value: \$110,503,019

Increase in project net present value by shortening the cash flow cycle: \$10,009,079. The seismic company has a value proposition to give the oil and gas company to justify higher compensation.

4. Conclusion: The fastest and lowest risk means available to seismic contractors to add value to seismic that will justify a higher price from the oil and gas companies is to import information technologies and business processes developed in other industries into seismic to shorten the cash-in-cash-back time line for the oil and gas companies. The new seismic business model and seismic license agreements should be created with the time value of money in mind.

VI. STRUCTURE OF LICENSE AGREEMENTS.

A. The four quadrants of information.

Knowledge can be divided into the four following sets: (a) general knowledge that is available to the public ("General Knowledge"); (b) general knowledge that each individual obtains from education and experience ("Experience"); (c) privately owned and legally protected knowledge that has been documented and registered with the government (patented, registered copyright, registered mark) ("Registered") and (d) privately owned knowledge that the owner must protect (trade secret) ("Confidential"). Generally, in the United States, everyone is welcome to use General Knowledge, only owners may use Registered knowledge, the individual owner may use Experience and, until the owner loses control over access to Confidential knowledge, only the owner may use Confidential information. Seismic data is a trade secret, Confidential information.

B. Elements of a multi-client data use license.

1. Ownership.
2. Licensee Rights.
3. Taxes.
4. Term.
5. Use by Third Parties.
 - 5.1 Consultants.
 - 5.2 Processors.
 - 5.3 Storage Contractors.
 - 5.4 Venture Participants.
 - 5.5 Disclosure Restrictions.
 - 5.6 Government Agencies.
 - 5.7 Related Entities.
 - 5.8 Exploration Groups.
 - 5.9 Confidentiality Notice.
6. Transfer of Data.
 - 6.1 Related Entities.
 - 6.2 Acquisitions/Mergers.
 - 6.3 Third Parties.
7. Reprocessing.
8. Remedies.
9. Warranties and Disclaimers.
10. Confidentiality.

11. Field Tapes.
12. Assignment.
13. Notices.
14. Waiver.
15. Governing Law/Disputes.
16. Entire Agreement.