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The Great Seismic Round-Up: The Canadian Forest Oil Story

Doug Uffen, Lisa Michetti, Linda Dickson, Judith Churchill, Jan Hay, Lyle Geck and Arnold Janzen

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Preface

Seismic data may be the least understood commodity within the oil industry. The evolution of seismic technology has seen seismic data take greater prominence in developing prospects to mitigate drilling risk. This has led to widespread use of seismic data and a proliferation of companies with ownership rights. The practiced rules and privileges of entitlement are known to those within the geophysical discipline that possess a seasoned perspective. These lessons were learned as we articled in the industry. Most instances of seismic data misuse are infrequent, but occasional ownership and licensing infractions do occur. These infractions are typically a result of either the lack of understanding of the rules and privileges of data ownership, or a result of poor seismic data records management. Most infractions are devoid of malice or willful intent.

The Chief Geophysicist's Forum, now a CSEG sub-committee, has discussed numerous issues regarding seismic data ownership in the hope to publish a set of standards of industry common practice. Many data ownership issues were discussed with the CSEG membership in the CSEG Seismic Data Issues Forum, last February. Heightening awareness to these issues is the first step towards compliance. The new CAPL 2000 agreement will describe seismic data and recognize it as confidential information as well as an asset, thereby recognizing that the value of seismic data evolves as properties are recycled through crown sales. Published guidelines for industry standard practice will assist the delegate membership as well as other disciplines within the oil industry to understand the rules governing seismic data ownership.

Awareness and education are a big part of the equation but seismic data records management becomes the other half of the equation. The quality of a corporation's seismic database may hamper its ability to follow any given policy for industry standard practice, be it internally or externally driven, if the information in it is fraught with discrepancies and inaccuracies. This then leads to the problem regarding the accuracy of those records and the completeness of those databases. Historically, these records were poor to non-existent in some companies. Fortunately today the quality of these records is improving as a result of new software tools and the recognition of seismic data as being an asset with potential monetary benefit through data sales. This trend is positive but are we doing enough? Infractions could lead to litigious situations. It is specified in an Act of Parliament, in the case of federally chartered lands, that a copy of all data must be maintained by the operator within the country at all times. Accurately recording and archiving this data is

part of regulatory compliance. Corporate take-overs, mergers, property farm-outs and divestitures can further compound the situation. Accurate records management becomes even more challenged as the supporting documentation may not be provided when the assets are transferred from one company to another. It is imperative to capture metadata information (ownership status, ownership percentages, AFE costs, acquisition parameters, etc.) with the seismic data. Failure to do so results in additional warranty work to build a complete database. An accurate database permits the rules and rights of data ownership to be invoked appropriately.

Purpose

In 1997, Canadian Forest Oil Ltd. (CFOL) embarked on the task of building a trustworthy wallmap that depicted all of the corporation's seismic data coverage. Early in this process, it became apparent that the seismic survey database had to be cleaned up to facilitate the creation of this wallmap. To clarify ownership status, certain metadata information had to be collected and populated into this database. The initial purpose of this exercise further expanded as the geologists and land department personnel requested access to this information for their own purposes. The geologists wanted to see if the corporation had seismic data coverage over a newly conceived play. The land department was concerned about ownership statuses and whether the lines shown on the wallmap could be included in a seismic option agreement for farm-out purposes.

A year later, commensurate with a shift in exploration focus from the Plains to the Foothills and Northwest Territories, CFOL recognized Federal regulatory compliance as being another reason to accurately inventory, catalogue and archive its seismic data. The corporation now had the obligation as an operator north of 60 degrees latitude to maintain a copy of the data in perpetuity.

Realizations

What ultimately ensued was the acknowledgement that the corporation could extract value from its seismic data in numerous ways. Not only did it have value to the corporation as confidential information to find oil and gas, but it had value as an asset through data sales as the revenue received was accredited directly to the seismic expenditure budget. Either way, value was to be extracted and realized. Furthermore, storing old archived workstation interpretations on disc permitted interpreters to respond quickly to land postings, property divestitures, land expiry situations and third party well notices, thereby reducing cycle time to give informed opinions to management. This permitted the company to maximize the knowledge derived from its data as well as the value of the data itself.

What began as a desire to have a wallmap of the corporation's seismic data coverage evolved over two years to a whole new definition of seismic data management, one in which the responsibility and accountability for the corporation's seismic data was recognized as it took control of its data. Value was always emphasized in this process. By putting in place the hardware and software tools to maximize the efficiency and internal use of the seismic data, from initial data capture through to workstation interpretation archival, and by cleaning up its seismic survey and inventory databases, the corporation is poised, by whatever means, to maximize the value of this asset. Perhaps most importantly, the corporation is now poised to comply with any industry standard practice rules and guidelines regarding seismic data ownership as a result of this effort and due diligence.

Methodology

A logical, incremental, step-by-step procedure was adopted as issues were recognized. The seismic database clean-up was handled in parallel with internal hardware and software upgrades. At the time, issues were tackled on a priority basis with the intent to logically sequence a solution with minimal capital expenditure. The data clean-up process can be classified in hindsight as a three-phase process. The hardware / software upgrades that facilitated the efficient internal use of the seismic data can also be classified the same way as a three-step process.

Phase 1

The Great Seismic Round-Up first started rather innocently enough with an Oracle database upgrade for the seismic inventory software and a hardware upgrade for the PC used to run the program. This was necessary to prevent frequent crashes of the software when multi-tasking occurred. As it was realized that the creation of the wallmap really was the correction and cleanup of a seismic survey database, the collection of survey data ensued in tandem with the clean-up of the seismic inventory database. SEGP1 survey information in the form of 3 1/2 inch and 5 1/4 inch floppies was collected to determine if it was already resident in the seismic survey database at the Excalibur- Gemini Group Limited. Numerous shotpoint mylar maps were also collected and cross-checked to see if these seismic lines were recorded in the seismic survey database.

As day-to-day operations continued, it was realized that searching for a seismic line quite often involved multiple paper listings of lines from different physical storage houses. The information resident within the seismic inventory software database was not complete. As over ninety percent of the corporation's seismic data was stored at Kestrel Data [Canada] Limited, physical storage accounts were consolidated at Kestrel so that multiple paper listings of lines would no longer be required. Items that were stored manually at Kestrel were re-inventoried and stored digitally, the results of which were loaded into Kestrel's centralized database. This information was then loaded into the corporation's seismic inventory database.

On the hardware and software side of this initiative, it was also noted at this time that there were no back-ups of current workstation interpretations except the occasional 8mm project back-up tape. Two DLT tape drives were purchased to provide full nightly back-ups for disaster recovery purposes. Problems with the functionality of interpretive software immediately prompted the upgrade of all geophysical software and mapping software to the most current maintained versions, with preferences given to network-distributed licenses for easy user access. Pentium 165 PCs were installed for all members of the department to enhance speed. More RAM was purchased for the HP 650 plotter to permit faster plot rasterization and decrease time waiting for plots.

Phase 2

The seismic data stampede ensued with the digital seismic survey database being enhanced by Excalibur-Gemini with the addition and correction of various Oracle database fields. This additional metadata information was necessary to capture for use of the seismic data in a business context. Geophysicists and land department personnel required ownership knowledge to recognize what permissions could be granted to the corporation's seismic data. As the corporation evolved under its new ownership, two additional storage accounts of Canadian data were inherited from the parent company and these data were transferred, fully inventoried, and integrated into the seismic inventory system at Kestrel. This information was uploaded into the company's seismic inventory software. The survey information was loaded into the seismic survey

database at Excalibur-Gemini. During the summer of 1998 three small corporate acquisitions occurred in as many months. The physical storage accounts of Saxon Petroleum, Anschutz Canada and the Northwest Territories data from Unocal Canada were also transferred to Kestrel where they were inventoried and uploaded into the corporation's seismic inventory database. Effort was made to collect as much metadata information as possible. The survey information was loaded into the company's seismic survey database commensurately.

With the seismic survey database as complete as possible and the seismic inventory database populated with as much information as possible, the stage was set for the great "shakedown" or ratification of the two databases. The seismic survey database was ratified to the seismic inventory database as the latter was believed to be more correct, having directly benefited over the years from AFE knowledge and personnel expertise. Alias line names and duplicate names were eliminated from the resultant centralized database. Orphan lines, lines with survey but no data or lines with no survey information at all, were researched against AFE information and Land Department documentation to check for validation of ownership. Corrections were made to both databases to eliminate as many orphan lines as possible. The result was a seismic inventory database that mirrored the seismic survey database. The resultant product was believed to be 96% correct and accurate to the corporation's historical activities and past events.

Commensurate with this activity, numerous geophysical hardware upgrades were initiated to streamline communications and increase the speed of data transfer for interpretive purposes. A 100 megabyte network line with the appropriate switches was installed to enhance data transfer speed between the two cross-mounted Sun Sparc workstations. The workstations were "turbo charged" with RAM, 100 megabyte network cards, and additional disc space storage capacity. The workstations further received new IP addresses, security firewalls, High Density 8 mm tape drives, and additional RAM for their plotter. An inherited Sun Sparc 10 from one of the acquisitions was configured as an X-terminal to one of the Sparc 20s. All of this brought stability, enhanced speed, better security, and ease-of-use for the interpreters to perform their daily work at minimal expense.

Phase 3

With the ratification of the seismic inventory database to the seismic survey database, the company was poised to purchase seismic data management software to inventory and track its seismic data. Software from Seisland Survey Ltd. (Seisland) was purchased as the central registry for seismic data archival and for the storage of old historic interpretive paper files. The data, previously stored in three separate databases (CFOL's, Excalibur's, and Kestrel's) was consolidated into Seisland's PPDM-compliant data management system to give CFOL full control of its data repository. Third party mapping software such as Labrador and DSL, that accessed seismic shotpoint information, was routed to Seisland's Oracle database, eliminating static dumps for duplicate databases for these software packages. A Quality Inspection (QI) module was written by Seisland to assist with the management of the data as an asset for promoting sales revenue. The roll-out of the new corporate seismic survey digital database to the broker community was effectively done at an open house meeting during June of 1999.

While inhouse control of the data was crucial, CFOL realized that this created the potential for the multiple databases to quickly get out of synch, effectively deteriorating data integrity. As a result, Seisland ROME was also installed to provide quick connectivity between CFOL and its data storage providers, using EDI transactions to communicate information electronically between databases. In a sense, CFOL is at the center of the wagon wheel, with each spoke a line of communication with a storage or service provider. Each

provider can now enter data “directly” into CFOL’s Seisland database, enabling a greater amount of data to be entered, minimizing dual entry, and improving the timeliness of information.

ROME was implemented on a static basis between CFOL and Kestrel to further manage the historical seismic data. ROME was also implemented dynamically between CFOL and Veritas GeoServices Ltd. (Veritas), who was selected as the online storage provider, on a go-forward basis, for new data acquired after January 1st, 2000. Warranty work has commenced on core exploratory regions to ensure that all components of the data are archived properly. Kestrel’s services are used for the physical storage of data acquired prior to January 1st, 2000 and for the temporary dead storage of online archived data.

In parallel to these initiatives, a new Unix server with 108 Gigabytes of RAID Disc was purchased along with 3 new Ultra 10s (360 Megahertz) machines. The faster machines minimize the time required to refresh screens and transfer projects from the server. The DLT tape drives were re-mounted onto the Unix server negating the need to back up the system across the network. An additional 108 Gigabyte disc was purchased to store internally, hot online, archived historical workstation interpretations. This facilitated rapid recall of old workstation interpretations to respond to third party well notices, land sales and development drilling location requirements. It also maximized personnel effectiveness by eliminating the need to restore and back-off interpretive projects as part of a disc management exercise.

Discussion

Subsequent to the roll-out of the new seismic survey database to the broker community, the number of requests for data quality inspections has increased. Seismic data sales revenue has increased by 50 percent on a monthly basis since the roll-out. In the first five months of the current fiscal year, the corporation has surpassed last year’s total for data sales revenue. It is important to keep in mind that a shift in exploration focus for the company rendered much of the historical seismic data to be of minimal value as confidential information and thereby available as an asset to generate sales revenue. Thought was given to the possibility of selling the trading rights to the proprietary data, but this was discounted as the database was small and lines were geographically scattered across the Western Canadian Sedimentary Basin. This negatively impacted the value of the data to a potential buyer and lead to the corporation acting as its own data manager for data sales.

At this time, the organization realized that a whole new definition of seismic data management had been carved out. The company was managing its data fully from initial data capture to workstation interpretation archival so as to maximize value from the data as confidential information and as an asset. The data itself as well as the knowledge derived from it represents the total value of the data. The saleable asset value is only a part of the total asset value.

Conclusion

What started as a round-up of seismic survey data to produce a master wallmap of the corporate database became a series of steps toward assuming the responsibility and accountability for managing and controlling the corporation’s seismic data in all aspects. Seismic data and the resultant interpretations have value in numerous ways to a company throughout its life as land is purchased and later expires. Seismic data evolves from being confidential information to an asset in this evolutionary process. Maximizing the value of the corporation’s seismic data or the knowledge derived from it through interpretation is the key element to the new definition of seismic data management. Being able to manage the data and the knowledge derived from

it efficiently, expediently and exactly enables a company to maximize its value if for no other reason than being able to find it when needed. Importantly also, the corporation is now poised to comply more fully with industry standard practices and regulations regarding seismic data ownership.

About the Author(s)

References