Protection of know-how in oil and gas technology transfer agreements (patent vs. trade secret and regulatory issues of hydraulic fracturing).
1. The concept of technology in oil and gas industry.

Technology has always played an important role in economic development. In oil and gas contexts, the local control is dependent on an effective transfer of technology by the involved country. In order to understand the meaning of "transfer of technology in oil and gas industry", firstly we have to determine the term of "Technology".

Technology can be defined in various ways. Traditionally, technology has been viewed as consisting of more or less technical innovations in products and production process which protected by means of patents. However, recently, technology has been defined “a systematic knowledge for manufacture of a product, or the rendering of a service in industry, agriculture or commerce, whether that knowledge be reflected in an invention, a utility model, an industrial design, a plant variety, or in technical information in the form of documentation, or skills or experience of experts, for the design, installation, operation or maintenance of an industrial plant or its equipment or for management of an industrial or commercial enterprise or its activities”. This definition covers both patented and unpatented knowledge and from the definition we can come into conclusion that not all knowledge here is considered in the context of technology. Knowledge should be systematic, knowledge should be reflected in any form or in some place, and knowledge should be directed to an end result. In short technology can be defined as knowledge, skills and process which are employed in developing and producing goods, materials and services.

Most of technologies involved in petroleum operations are rooted in science and engineering disciplines. They involve geological, geophysical, drilling, reservoir engineering, equipment and installations of plants etc.

2. The role of IPRs in protection of oil and gas technologies.

The oil & gas industry owns a large variety of high-technology techniques. The main problem occurs when this technologies are transferred through different business models. The oil & gas industry has begun, in recent years, to realize how important IP is to the industry. For these reasons, intellectual property rights can constitute extremely important assets in modern oil & gas companies’ portfolios. Therefore, the IP committee in each oil and gas company should decide whether to pursue a patent or a trade secret protection for a given innovation, based on a combination of commercial and legal factors. For example, some things, such as databases, are simply not patentable and thus must be maintained as a trade secret.

International technology transfer typically takes place via trade, foreign direct investment, joint ventures with local partners, or simple technology licensing. In all of these cases, foreign firms run the risk that imitation may occur. The imitation risk is generally
greater in middle income countries than in low income countries. This risk is further increased if technologies require “local adaptation” in order to fit local needs and regulatory requirements. A certain level of absorptive capacity is necessary to adapt imported technology. And secondly, “the presence of enforceable IPRs” is also important in facilitating technology transfer to middle income countries that already have innovative capacity or are capable of imitation.

If the absorptive capacity is strong but IPR protection is weak, foreign firms will tend to establish distribution rather than manufacturing subsidiaries. But, if IPR protection is strong, foreign firms may prefer to license technologies instead of choosing to be a local presence. “It is also conceivable that stronger IPRs increase the incentives for firms to exploit IPRs themselves instead of licensing out”.

Despite evidence that IP protection sometimes encourages technology transfer, firms typically do not rank IPRs highly as an influence on the technology transfer decision.

Two general classes of intellectual property rights exist: “hard” intellectual property rights (including patents, trade-marks and copyright) and “soft” intellectual property rights (including confidential information, trade secrets and know-how).

**Hard intellectual property rights**

Deciding between patents or trade secrets is not so straightforward, especially where technology innovation is often susceptible to alternative forms of protection, such as in the oil & gas industry.

Patent promotes the progress of science. If an inventor can receive a legal monopoly over an invention, he can obtain monopoly profits and thus have an extra economic incentive to attempt to invent. And at the same time, after expiration of patent the invention enters the public domain.

The following circumstances increase the risk of loss of trade secret protection and cause to a bias towards patenting:

1. *Government regulation requires disclosure* of information to a government authority;
2. Investors feel more comfortable;
3. The invention is easily visible in the marketed product or service (so that it can be easily reverse-engineered);
4. Licensing is a desired business strategy;
5. The technology has been jointly developed;
6. Nature of the innovator’s business requires regular collaboration with third parties and solid knowledge transfer;
7. Employee mobility is likely (that increases the risk of information disclosure);
8. There are many potential customers or customers receive on-going technical support;
Protection of know-how in oil and gas technology transfer agreements (patent vs. trade secret and regulatory issues of hydraulic fracturing)

Author: Faig Alizada

9. Sales process requires information exchange between vendors and customers;

10. There is significant risk (significant market opportunity) that competitors will independently develop the same technology (because once you innovate in any industry your competitors in parallel, search for a solution to the same problem);

11. In parallel with filing a patent application, “defensive publication” of the invention could be effected so as to trigger more immediate prior art consequences, and assist in preserving the innovator’s right to use the invention, versus waiting for the patent application to publish in the normal course of prosecution of a patent application (typically, 18 months after its filing).

Since we are talking about technology transfer, we can underline that patenting is the preferred choice when its deterrence power is high or when licensing potential for the invention is attractive. “The value of patents as licensable rights increases where:

1. The territorial reach of a business organization is limited;
2. The invention is embodied in a non-core technology;
3. The invention relates to a disruptive technology; and
4. The patent landscape is fairly crowded and there is a concomitant increase in the risk of an infringement claim by a competitor”.

Arora and Ceccagnoli (2006) use data from the 1994 Carnegie Mellon Survey on U.S. manufacturing firms conducting R&D to investigate the relationship between firm licensing behavior and the strength of patent protection. The authors find that the effect of stronger patent protection on licensing depends on whether the firm owns specialized complementary assets. If they have such assets, stronger patent protection leads them to patent more but not necessarily to license more.

The oil & gas industry employs a large variety of high-technology techniques, many of which may be patented as new devices, methods, processes, or computer software-implemented algorithms. However, many of them relate to processes whose commercial exploitation does not require their public disclosure, and which are difficult to reverse engineer from the resultant commercial product deriving from such processes. Therefore, in such cases trade secrets can be the best tool of protection of know-how.

Soft intellectual property rights

Talking about international regulatory framework for the protection of know-how, we have to emphasize Article 39 TRIPS (which protects know-how as trade secrets) and Article 10bis of the Paris Convention for the Protection of Industrial Property (which establishes an obligation against unfair competition).

The TRIPS Agreement accomplishes this by specifying that Article 10 bis of the Paris Convention applies to “undisclosed information” (art. 39.1, TRIPS Agreement), and by defining what shall constitute protection of undisclosed information (art. 39.2, id.). Article 39.2 provides:
Protection of know-how in oil and gas technology transfer agreements (patent vs. trade secret and regulatory issues of hydraulic fracturing)

Author: Faig Alizada

1. Members shall protect undisclosed information.

2. Natural and legal persons shall have the possibility of preventing information lawfully within their control from being disclosed to, acquired by, or used by others without their consent in a manner contrary to honest commercial practices.

For the purpose of this provision, “a manner contrary to honest commercial practices” shall mean at least practices such as breach of contract, breach of confidence and inducement to breach, and the acquisition of undisclosed information by third parties who knew, or were grossly negligent in failing to know, that such practices were involved in the acquisition.

After emphasizing the legal provision of know-how, I want to turn to the question of “Soft” IP rights. “Soft” IP rights usually refer to a category of rights that are not protected by legislation but nonetheless fall into the category of “intangible” rights and are usually associated with other intellectual property rights. These rights include “know-how, trade secrets and confidential information” “that may give a company an advantage over competitors” and “traditionally protected in civil and common law countries against misappropriation through dishonest practices. In other words, trade secrets covers formulas, processes, methods and techniques. Even broader than the process category of trade secrets is the category of know-how (Information concerning the practical application of specific inventions, formulas or processes) which covers knowledge, experience and skills including technical data which could not be recorded in writing. “Technical Data” means all written information on Know-How, including, but not limited to research report and all technical data and information on design, calculation, drawings, manufacturing process, quality control, experiment, installation, measurement and test methods, operation, maintenance manuals and instructions, latest and complete date on the functioning of the product.

On the other hand, several countries differentiate between manufacturing secrets and commercial secrets. The first category of trade secrets is related to information of purely technical character, like production methods, chemical formula, blueprints or prototypes. Commercial secrets includes sales methods, distribution methods, contract forms, business schedules, details etc.

Confidential or proprietary information, on the other hand, may not necessarily be known only to the owner of it γ it may be a compilation of information that has been collected by a company through the expenditure of time and resources, and therefore it has value without being inherently “secret”. Examples of confidential information include customer lists, databases and certain know-how (mainly related to commercial trade secrets). From that, we come into conclusion that, know-how may be a subset of trade secrets and confidential information as well.

The benefit of maintaining a trade secret is that it does not expire; the right preserves its value for so long as the information remains confidential and is not required to disclose protected information to the public. However, once the information becomes public, the trade secret loses all of its value.

Disclosure, reverse-engineering, or independent invention may destroy the trade secret. One disadvantage of relying on trade secret protection is that a competitor who
Protection of know-how in oil and gas technology transfer agreements (patent vs. trade secret and regulatory issues of hydraulic fracturing)

Author: Faig Alizada

independently invents the subject of another’s trade secret can obtain a patent on the device or process and actually prevent the original inventor (the trade secret holder) from using the invention. There is a bias towards trade secret protection where there is confidence that the invention could be maintained in secret and where it is unlikely that the same invention will be independently developed or reverse-engineered by a competitor.

Since trade secrets can protect secret information and processes, they are extremely important to the oil & gas industry, especially given the diminished ability of copyright to protect compilations of data and maps, discussed above. They can also be used to protect software source code that is not disclosed and not otherwise protectable by patent.

In summarizing above discussed comparative analyzes we can come into conclusion that since most of technologies in oil and gas industry are related to processes whose commercial exploitation does not require their public disclosure, which are difficult to reverse engineer from the resultant commercial product and difficult independently develop, the best protection tool can be know-how (trade secret).

**Mandatory disclosure of fracturing and trade secret.**

Most deposits of oil and gas are located in pore spaces that are found in certain subterranean rock formations. And the pore spaces are not very well inter-connected because of their low permeability. Therefore, the oil and gas remains trapped in isolated pore spaces. But if a person could create cracks or fractures in the rock formation, oil and gas could use those fractures as pathways to the well bore. And that could make drilling economical, despite the formation’s low permeability.

Before using hydraulic fracturing, an operator drills a wellbore down into the shale formation. Then, in order to get at shale gas, oil and gas operators (or a “service company” that it has hired) use a process called “hydraulic fracturing” or “fracking” for short. Fracking is a technique in which large volumes of water, sand (or similar material), and other additives (chemicals) are pumped into the ground at extremely high pressure (to create fractures in underground rock formations by pushing a fracturing fluid down the well to the formation to be fractured and) to break up rocks containing oil and gas to release the resource. Fracking is not a new process; it has been used to produce oil and methane gas from coal beds for decades.

After fracturing is complete, operator or service company turns off the high pressure pumps and some of the fluids that were pumped into the ground flow back up through the wellbore (so-called “flowback water”) to the surface; flowback water typically contains some of the original fracturing fluid constituents, as well as other chemicals, materials and toxic substances that are naturally found underground, including arsenic, barium, lead, mercury, and radioactive elements like radium.

The hydraulic fracturing process was used primarily in oil or gas wells that were drilled vertically. Companies were not using the process in shale formations. A company
first time called Mitchell Energy experimented different techniques and eventually developed a process that worked (in 1997).

**Importance of disclosure**

The combination of horizontal drilling and improved techniques for hydraulic fracturing made the development of shale plays more profitable, and companies began to operate in more shale plays. As shale play activity increased, the amount of oil and gas drilling began to increase significantly in areas of the country where there had not been significant oil and gas activity in generations. People began to express concerns that hydraulic fracturing might cause harm to the environment and might cause contamination of groundwater. “Blow-outs have occurred during fracking operations and spills of fracking fluids and other chemicals have polluted streams and lakes. Documented reports link fracking contamination with medically-confirmed health impacts in animals, including diseases, deaths, and second-generation birth defects. Opponents of fracking allege that it poses unique risks to human health and the environment. The “most contentious” issue is whether hydraulic fracturing fluids injected into deep shale formations could escape into drinking water sources and cause contamination. According to the Waxman Committee Report, more than 650 of the products used in hydraulic fracturing contained chemical compounds that are known or possible human carcinogens. Both environmentalists and industry supported the adoption of disclosure regulations. Environmentalists supported disclosure regulations because they wanted information regarding the content of fracturing fluids. Industry supported disclosure in part because it hoped such disclosures would address some of the public (including health and safety professionals) concerns about fracturing, such as:

1. Fracking might cause harm to the environment. So the public want fully understand the risks to their air and water in order to appropriately respond to accidents and emergencies. Therefore, they want to have full access to information on the constituents of hydraulic fracturing fluids and to the forthcoming process. Because, Often fracking takes place in close proximity to homes, schools, and workplaces;

2. Fracking might cause contamination of groundwater and pollute streams and lakes. Chemical disclosure is crucial to aid in determining the source of any subsequent groundwater contamination. Thus, public wants to assess the effects of hydraulic fracturing in order to conduct baseline testing to establish the quality of their water prior to hydraulic fracturing. Because, it provides the public information about the impacts of fracking on state supplies of fresh water;

3. It has got health impacts in animals, including diseases, deaths, and second-generation birth defects. Medical professionals require full access to information.

Oil and gas companies have resisted disclosure of the exact composition of fracking fluids on the grounds that these mixtures are trade secrets. Because, creating a fracking
Protection of know-how in oil and gas technology transfer agreements (patent vs. trade secret and regulatory issues of hydraulic fracturing)

Author: Faig Alizada

Fluid mixture that produces the desired results is an extremely complicated task. Without effective trade secret protection, public disclosure would allow imitation and reverse engineering of highly proprietary information. On the other hand, “without requirements for disclosure, members of the communities in which it occurs have no right to information about the procedures or chemicals involved.

Taking into account the nature of oil and gas industry and the characteristics of different technology transfer agreements we can state that the best tool for the transfer of these know-how can be know-how Agreements. But, before signing a contract we have to determine the scope of the know-how which will be protected or disclosed. Here we have to consider the disclosure requirement from different point of view. Both environmentalists and industry supported the adoption of disclosure regulations. Oil and gas companies have resisted disclosure of the exact composition of fracking fluids on the grounds that these mixtures are trade secrets. On the other hand, regulatory bodies needs disclosure because: 1. If a trade secret claim asserted by a company lacked merit, but the company in the meantime has gone out of business, it might not be possible to obtain the information in order to disclose it publicly; 2. In the event of a spill, emergency responders might be able to obtain information regarding the complete composition if a state agency possesses that information.

In my view if we are talking about disclosure of hydraulic fracturing it is indisputable that it should be disclosed but with trade secrets exemptions (via fracfocus or some other ways). However, if a company is claiming that any information is trade secret it should be shielded by law. In this case, firstly we have to identify the specific information that constitutes the company’s trade secrets. Exemptions must only be used for legitimate trade secrets, and regulators have to determine what information genuinely deserves trade secret protection. To ensure that trade secret claims are legitimate, companies should be made to provide specific factual justification. Even if the information is shielded by trade secrets, the operator still should be required to provide some information regarding the substance, to be held confidentially and still may be possible to reveal substantial information about the contents without actually placing the trade secrets at risk. For example, the family of a chemical additive could be disclosed but not its specific composition, or the additives concentration perhaps could be expressed as a range of values instead of a precise figure.

After identifying the specific trade secret information that must be protected, the company next must consider to whom the disclosure must be made and under which circumstances. Some countries may mandate at least limited public disclosures, while other countries require disclosure only to the relevant state regulator. In all cases disclosure is held confidentially and should only be made to Government. States are not interested in trade secret examination and disclosure for the following reasons:

1. Many regulatory agencies apparently do not use the information for anything.
Protection of know-how in oil and gas technology transfer agreements (patent vs. trade secret and regulatory issues of hydraulic fracturing)

Author: Faig Alizada

2. Because examination of trade secret claims is costly, “especially when high pressure, high temperature, and volatile hydrocarbons must be safely combined”, and in many cases may simply result in a determination that the trade secret claim is proper.

3. There is also increased risk of inadvertent disclosure in trade secret examination. The information that the agency must obtain and review in order to test a trade secret may include the trade secret itself. Colorado regulators in (USA) noted that this increases the risk for inadvertent disclosure.

4. There is likelihood of being sued under public records statutes if there is trade secret. If the agency receives trade secret information, it may receive a public records request for the information. In this case agency could refuse to disclose the information on the basis that the public records law does not apply to trade secrets. If the person then realizes that the agency’s refusal was improper because the information did not qualify as a trade secret, he/she could sue the agency. Colorado regulators have noted this potential problem, and Wyoming’s Oil and Gas Conservation Commission has already been sued under this exact scenario.

There are two circumstances, however, in which the holder of the trade secret must disclose it. One is upon the request to a “health professional” upon showing that she needs the information for diagnosis and upon her signing a confidentiality agreement. The other is upon the demand of the relevant Commission in response to a spill or incident.

After considering above discussed issues it is possible to sign a know-how agreement. Because, now we have got protected know-how that can easily be transferred. Once the disclosure issues are solved about fracking depending on the interests of parties, they can sign know-how agreements and can grant as much rights as they want to the other party. The only controversial issues here are future arising issues, such as, putting ban on fracking by government. Therefore, drafting know-how contracts, especially in such fragile areas need high proficiency from the lawyer. So, the lawyer should consider and agree with other party future possible arising issues in detail. There should also be adopted special legislation in international level regulating investors rights in such cases. Special compensation should be considered in the case of ban in order to attract investors. Mandatory disclosure, possible government bans are real and potential problems for service companies and investors. In this sense, I can tell that the main problem of hydraulic fracturing is not mandatory disclosure rules, but future arising bans. The reviewed ban practice and dangers of fracking can prove it.

In order to determine the scope of the trade secret we were trying to balance interests of connected parties. To avoid future bans we should striking the right balance between the interests of country and other parties. It is obvious fracking is beneficial for the countries economic development. As the same time it has got drawbacks that we already discussed. Fracking holds the promise for a bright future for both the oil and gas industry.
Disclosure does not, by itself, make fracking safer. An adequate regulatory regime must also include. NRDC (Natural Resources Defense Council is a national nonprofit environmental organization with more than 1.3 million members and online activists since 1970) is currently undertaking research concerning other aspects of states’ regulation of oil and gas development, beyond disclosure. Governments obliged to set up standardization of best practices and minimization of bad impacts of fracking. If technology is being done environmentally sound way, for example by using use of natural power such as solar or wind energy it can solve all the problems. However, environmentally sound ways of getting energy or setting up renewable energy operations is more expensive, in the short term. One thing is clear that if all fracking operations will be stopped immediately, the negative economic impact would be felt globally. Therefore, for the beginning governments should prevent new fracking operations from starting up, rather than banning it. At the same time companies have to keep reducing environmental footprint of previous fraking operations. And during this processes it should be work out the ways of transformation to environmentally sound technologies.

Energy is all around us, we have to be smart and just to capture it in environmentally sound way in order to use it in our industry for our future!