

Practical IP Lessons From the Field: Field Trials, Trade Secrets, and the Hydrogen Horizon

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KEY POINTS

- **Field trials and early-stage IP protection:** Field trials, commonly used in the oil and gas industry, present a range of intellectual property risks that can largely be mitigated through proactive measures including nondisclosure agreements, noncompete agreements, and joint inventor agreements.
- **Public disclosure risks:** Debuting new technology at field trials or industry trade shows can constitute a public disclosure, potentially jeopardizing patent eligibility both domestically and in foreign jurisdictions where absolute novelty is required.
- **Trade secret protection and employee mobility:** Oil and gas technology may also be safeguarded through trade secret law; however, this form of protection carries significant vulnerabilities when employees depart and take institutional knowledge to competing firms.
- **Green hydrogen and hydrogen hubs:** Much like field trials, emerging green hydrogen projects and hydrogen hubs raise complex questions for IP counsel concerning ownership allocation, collaborative agreement structures, long-term preservation strategies, and the management of public disclosures.

As operators, service companies, and technology providers in the oil and gas sector invest heavily in new tools, automation, and low-carbon initiatives, their intellectual property (IP) profile is changing just as fast. Field trials, rapid digitalization, and large-scale hydrogen projects create real opportunities to build durable competitive advantage — and real risks if IP is not protected and allocated carefully.

From the well site to the U.S. Patent and Trademark Office (USPTO), several practical themes emerge for energy companies. This article highlights those themes and explains key legal concepts in business terms.

I. FIELD TRIALS: ESSENTIAL, EXPENSIVE, AND IP-SENSITIVE

Oil and gas companies frequently “prove out” new technologies through field trials at well sites or other operational locations. These real-world tests are critical for adoption — but they can also create significant IP exposure if not handled carefully.

1. Employee obligations: NDAs and noncompetes

When new technology is deployed in the field, one of the first IP issues is your own employees:

- **Nondisclosure agreements (NDAs):** These are contracts in which employees agree not to share confidential information (such as designs, test data, or operating methods) outside the company. NDAs help preserve trade secret status and prevent informal “leakage” of know-how to competitors. Companies typically incorporate NDAs into their standard employment agreements, which employees must sign before they begin work.
- **Noncompete agreements:** These are contracts that restrict employees, for a defined period and geography, from working for direct competitors or starting a competing business after leaving. In many energy companies, noncompetes are used alongside NDAs to reduce the risk that key technical talent can immediately take sensitive know-how to a rival. Noncompete laws vary from state to state. California law prohibits noncompetes, while Florida actively enforces noncompete agreements.

In the field-trial context, ensuring that employees involved in testing are “wrapped up in good, tight NDAs” (and, where appropriate, noncompetes) is a first line of defense against losing control of valuable technology.

2. Third-party contractors and co-development partners

Field trials often involve service companies, tool providers, or other contractors at the well site. Those third parties are often close to the technology and the performance data. They should also be bound by robust NDAs to protect confidential information generated during the trial.

Where technology is being developed or refined “with” another party, it is critical to have a formal agreement that clearly sets out:

- Who owns the technology each party brings into the project;
- Who owns any improvements or new inventions created during the trial; and
- Whether any individual or entity should be treated as a **joint inventor** on any resulting patents.

A **joint inventor** is someone who makes a significant contribution to the ideas claimed in a patent. If joint inventorship is not addressed upfront, disputes can arise about whether a collaborator should be listed as an inventor, what share of ownership they should receive, and what rights they have to use or license the technology.

II. PATENT TIMING AND PUBLIC DISCLOSURE: AVOIDING “BLOWN” DEADLINES

Another key lesson from field trials is that timing matters.

When new technology is tested in the field or shown at a trade show, those activities can amount to a **public disclosure** — that is, making the invention available to people who are not bound by confidentiality. Public disclosures can start the clock on patent deadlines.

Several concepts are important here:

- **Patent application:** A filing with a patent office that describes an invention and seeks legal protection, typically giving the patent owner the right to exclude others from making, using, or selling the invention once a patent is granted.
- **One-year “grace period” in the U.S.:** Once a public disclosure occurs (for example, a visible field test or trade show presentation), companies generally have one year in the U.S. to file a patent application on that invention.

If they miss that one-year window, they risk losing the ability to obtain a valid U.S. patent.

- **Foreign jurisdictions without the same grace period:** Not every country provides that one-year timeframe. Some non-U.S. systems treat public disclosure much more strictly, so a disclosure at a field trial or trade show may jeopardize patent rights abroad if filings are not made early enough.

For companies operating or marketing globally, coordination between engineering, business development, and IP counsel before public disclosures is essential. The goal is to ensure that field testing and marketing activity do not inadvertently “blow through” patent deadlines in key jurisdictions.

III. TRADE SECRETS AND DEPARTING EMPLOYEES: PROTECTING THE KNOW-HOW BEHIND THE WELLHEAD

Beyond patents, oil and gas innovations often depend heavily on **trade secrets**.

A **trade secret** is information that:

- Has economic value because it is not generally known (for example, formulas, processes, algorithms, or operating procedures); and
- Is subject to reasonable efforts to keep it secret (such as NDAs, access controls, and internal policies).

In practice, disputes frequently arise when employees leave and join competitors:

- Some individuals mistakenly assume that inventions/techniques they developed while employed “belong to them” personally. In many cases, however, IP created in the course of employment belongs to the company under employment agreements or applicable law.
- Hiring employees from a company that owns relevant patents or trade secrets can trigger trade secret and noncompete disputes, especially when those employees move into similar roles with a competitor.

For example, we previously handled a matter that involved alleged trade secret and noncompete violations after new hires were brought in from a patent owner/competitor, which was understandably unhappy about the situation. As the dispute progressed and was ultimately resolved, labor and employment colleagues with deep experience in noncompete and nondisclosure issues in the oil and gas sector were brought in to help.

The practical takeaway for energy companies and their counsel:

- Review and tighten employment, nondisclosure, and noncompete agreements for key technical personnel;
- Conduct careful diligence before hiring from competitors; and
- Coordinate between IP and employment counsel early, particularly when the new hires will work on similar technologies as those used at their former employer.

IV. DIGITALIZATION, AI, AND REMOTE OPERATIONS: NEW IP AND SAFETY DIMENSIONS

Rapid digital transformation is reshaping oil and gas operations. The cost of a typical fracking well can exceed \$10 million, making efficiency and safety critical business drivers.

AI-enabled and digital technologies are:

- Modernizing how operators and service companies drill wells;
- Reducing the **footprint** of a well — that is, the amount of equipment, time, and personnel required; and
- Supporting increased **automation** to reduce the number of “hands on the rig,” thereby decreasing the risk of injuries on site.

Petroleum and drilling engineers can now run rigs essentially remotely from the operator’s office, including in offshore operations where large drill ships are directed from onshore locations.

These advances generate new IP in areas such as software, control systems, and integrated equipment designs, often involving multiple contributors. They also increase the importance of:

- Thorough NDAs and IP provisions with vendors and service companies involved in digital systems; and
- Early decisions about which aspects of new digital tools to protect as patents and which to maintain as trade secrets.

V. THE HYDROGEN HORIZON: USING EXISTING INFRASTRUCTURE FOR NEW ENERGY — AND NEW IP

There is growing momentum to position Houston and the Gulf Coast as a center of **clean hydrogen**. Several building blocks are already in place:

- Pipelines and storage facilities capable of being used for hydrogen, including large salt domes in East Texas;
- Refineries that can be adjusted to handle hydrogen; and
- Offshore wind resources that can help power the production of **green hydrogen**.

Green hydrogen is hydrogen produced using electricity (for example, from renewables) to separate hydrogen and oxygen in water. This approach is viewed as a “greenest” form of hydrogen because it can significantly reduce lifecycle emissions compared to hydrogen derived from fossil fuels.

The emerging **hydrogen hub** concept in Houston involves a collaborative effort by major oil and gas companies to:

- Put the necessary infrastructure in place; and
- Move forward with large-scale green hydrogen projects in the region.

For IP and legal teams, hydrogen initiatives raise familiar but complex questions:

- How should ownership of new hydrogen-related technologies be allocated among multiple participants?
- How should collaborative agreements and licenses be structured so that each party has appropriate rights while preserving long-term value?
- How should field pilots and demonstrations be coordinated with patent filing strategies to avoid premature public disclosures?

These issues will become more acute as hydrogen projects progress from concept to deployment.

VI. CONCLUSIONS AND TAKEAWAYS – STRIVE FOR AN INTEGRATED IP TEAM FOR ENERGY INNOVATORS

Successful IP strategies in oil and gas depend on coordination across multiple IP functional areas:

- **IP litigators**, who focus on disputes and related settlement and license agreements;
- **IP transactional and prosecution practitioners**, who:
 - Manage patent and trademark portfolios;
 - Handle patent prosecution (drafting, filing, and shepherding patent applications); and
 - Structure collaborative agreements and licenses for new technology development; and
- **Technical advisors and attorneys with engineering backgrounds** in areas such as electrical, chemical, and mechanical engineering, including teams in Houston and Dallas that specialize in oil and gas technologies.

This integrated approach allows energy companies to align projects with a coherent IP plan — from initial invention capture and confidentiality, through patent and trade secret protection, to enforcement in court when necessary.

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