

Fuelling IoT litigation

The IoT is impacting all industries. **Charles Everingham, Rehan M Safiullah** and **Thomas W Landers IV** look at its effect on gas and oil



As Bill Gates said, “The advance of technology is based on making it fit in so that you don’t really even notice it, so it’s part of everyday life.” The “internet of things” or “IoT” epitomises this concept. IoT devices are changing the way we interact with our world, and some are calling the proliferation of IoT devices a new industrial revolution. So, what is IoT and how will it impact IP in the oil and gas industry?

The “internet of things” refers to the concept of connecting devices in a network to create automation or self-control. Through IoT, the devices we use every day are becoming “smart” – that is, they are being connected with other devices and are using accumulated data to make “intelligent” decisions for us. One example is a “smart” navigation app that provides better routing based on data from other devices, such as real-time weather and traffic information.

But IoT devices are also changing whole industries, including electronics, water and waste water, oil and gas, chemical, transportation, pharmaceutical, food and beverage, and manufacturing. Many companies are now using industrial IoT (IIoT) systems, which use numerous sensors to collect and use data – often called “big data” – to make intelligent decisions.¹ Often, such sensors are connected to the “cloud,” which acts as the brain of the system – collecting and processing data from thousands of sensors across the country.² By using the cloud, companies can process the data remotely – saving space and keeping the device simple.

IIoT

Although some perceive the oil and gas industry as technologically slow, in fact it has demonstrated a capacity to adopt disruptive technology, such as horizontal drilling and fracking. And IIoT has potential to be the next disruptive force. Oil and gas companies are seeking to adopt IIoT systems for greater efficiency, profits, and safety. Safety in particular is a major concern for oil and gas

companies as many of their employees work in very dangerous environments.³ One way to address this concern is to use IIoT systems to monitor and control dangerous processes remotely.

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Major oil companies are already using IIoT devices to monitor and control remote facilities in the midstream and downstream sectors.⁴ Operators use sensors to centrally monitor and control things like pressure, volume levels, flow rates, and temperature.⁵ At the end of 2018, over 1.3m IIoT devices in the oil and gas industry featured cellular or satellite connectivity.⁶

The major upstream oil companies (eg, Chevron, ExxonMobil, BP, etc) are collaborating with vendors to deploy IIoT systems in their upstream installations. Chevron, for example, has added IIoT sensors to heat exchangers – devices that remove heat from fluids during fuel processing. The IIoT sensors collect and send real-time data from the heat exchanger to the cloud, providing information about the health of the exchanger that the company uses to predict future conditions of the machine.⁷

Vendors like Emerson, Siemens, Schneider Electric, Yokogawa, Honeywell, ABB, and Rockwell Automation are servicing the upstream oil and gas market.⁸ The IIoT products offered by these vendors are most often complete and integrated systems. Other technology companies, like Dell (Edge Gateway) and Microsoft (Azure), are also

providing integrated IIoT systems for the oil and gas industry.

IIoT patents and patent filings

A recent report found that “[p]atent filings relating to the Internet of Things are skyrocketing” and that “virtually every industry has taken notice of this technology and is spending heavily on IoT integration.”⁹ The oil and gas industry is no exception, and companies will need to understand how to protect their IP - and defend themselves - in the wake of an increasingly complex IP landscape. The first step is to know what’s being filed and who’s doing the filing.

A review of patent applications filed since January 2017 reveals that three general classes of entities have filed patent applications on IIoT technologies that could impact the oil and gas industry:

- small companies offering specific IIoT solutions for various industries
- large technology companies offering IIoT systems, and
- oil and gas companies offering IIoT solutions for the oil and gas industry.

Most of the recent patent filings for IIoT solutions in the oil and gas industry have been by smaller companies, such as start-ups. These companies tend to be software companies providing IIoT solutions to various industries. APANA, Inc, for instance, provides an “Intelligent Water Management Platform.” Its recently-issued patent, US 9,929,772, covers a monitoring device that provides data about instruments via a water sensor. The specification discloses that the monitoring location can include an oil refinery. Another company, Nebbiolo Technologies, has filed a patent application, US Pub 2018/0115519, which discloses security applications for “fog” computing devices (ie, devices operating on a distributed network that connects the device and cloud data) that can be used on oil and gas rigs. Some of these smaller companies filing patent applications may also be patent enforcement entities that are in the business of

licensing patents to companies in the oil and gas industry without making actual products of their own.

Technology companies, including Intel, GE, HP, and Dell, have filed patent applications that incorporate IIoT systems or devices that can be applied to the oil and gas industry. For example, GE's Patent Publication No 2018/0080890 covers a remote sensor for monitoring specific environmental conditions. While not limited to oil and gas, the application describes sensors for detecting gas leaks within the oil and gas industry. Further, the application discloses that the sensor "may be connected wireless or wired to the Internet of Things" in both the specification and proposed claims.¹⁰

Another example is SAS Institute, which develops and offers analytics software. SAS has been extremely active in filing software-related patent applications that incorporate IIoT technology with potential use in the oil and gas industry. IIoT-related patent applications filed by other tech companies similarly cover devices or systems that can be used in various IIoT applications, including in the oil and gas industry. See, eg, US Pub 2018/0191553 (HPE), US Pub 2018/0234519 (Dell).

Oil and gas companies, including Schlumberger, Weatherford, Halliburton, and others, have also been filing patent applications covering IIoT systems. Examples include methods for collecting multiple user requests for digital rock simulation over the cloud (WO 2018/217118 to Schlumberger) and IIoT sensors for monitoring the health of oilfield equipment (WO 2019/023366 to Weatherford). These filings indicate that oil and gas companies themselves are entering the IIoT space and are starting to protect their IIoT technology through patents.

The upsurge in IIoT patent applications with uses in the oil and gas industry shows that IIoT technologies are becoming a major consideration for oil and gas companies. Notably, however, many of the patent claims - both proposed and issued - cover a combination of software and hardware, and it is likely that many will face serious challenges to patentability based on the *Alice* framework, particularly in light of the Federal Circuit's *Electric Power Group* case.¹¹ Both the USPTO and the district courts have relied on that case to reject inventions that involve data input, monitoring, processing, and output - features involved in IIoT. Regardless, the greater emphasis on IP protection by companies of all sizes makes it likely that litigation involving IIoT technology will increase.

Litigation involving IIoT

Although litigation in the IIoT space is still developing, the oil and gas industry is already

seeing some cases. What is yet to be seen is how and between whom the patent battles will be fought. In the telecom and tech industries, for example, not only were patent enforcement entities bringing lawsuits against the industry players, the major telecom companies were suing each other across the country. Indeed, Apple's long-running patent battle against Samsung, which began in 2011, ended only last year. Will IIoT be the same? One recent patent case illustrates some of the likely players in the coming IIoT patent battles.

"The *TDE* lawsuit is an early example of a case where IIoT technology in the oil and gas industry was at issue."

In May 2015, a small services company located in Sugar Land, Texas, named TDE Petroleum Data Solutions, sued Mobilize, a tech company providing services to the oil and gas industry, for patent infringement. TDE's patent covered an automated method and system for determining the state of well operations. TDE targeted Mobilize's software that automatically determines well states for drilling systems by aggregating data directly from the field, including real-time analytics. The court ultimately dismissed the lawsuit, determining the claims were too abstract to satisfy the *Alice* test.

The *TDE* lawsuit is an early example of a case where IIoT technology in the oil and gas industry was at issue, and it was between two service companies specifically focusing on the oil and gas industry. Might this be the trend going forward? Are the technology companies that are providing IIoT solutions to the major oil and gas companies opening themselves up to start-ups or other tech companies with IIoT-specific patents? Because the technology is relatively new, it is likely that, at first, smaller companies (and perhaps, patent enforcement entities) will bring lawsuits against the major tech companies and oil and gas companies. But it remains to be seen whether any of the oil and gas companies, or their vendors, will launch lawsuits against each other.

Summary

The recent surge of IIoT technology and its adoption in the oil and gas industry indicates that IIoT software and devices will be commonplace for oil and gas companies.

This surge, coupled with increased patent filings on IIoT technology with oil and gas applications, indicates that patent litigation on these products will likely rise. Companies in the oil and gas sector that are adopting IIoT technologies need to be aware of their own IP relating to IIoT and need to consider what IP competitors, as well as smaller companies, are accumulating in the IIoT space. In the words of Steve Jobs: "No, we don't know where it will lead. We just know there's something much bigger than any of us here."¹²

Footnotes

1. <https://www.iotevolutionworld.com/m2m/articles/441938-internet-things-the-cloud.htm>
2. <https://www.iotevolutionworld.com/m2m/articles/441938-internet-things-the-cloud.htm>
3. <https://blog.rmiwyoming.com/the-dangerous-life-of-a-roughneck-the-truth-about-oil-drilling-safety-hazards>
4. <https://www.smart-energy.com/industry-sectors/iiot/reasons-behind-6-8-increase-iiot-devices-for-oil-gas/>
5. <https://www.apnews.com/Business%20Wire/65bf7495625f4fb6b14bc17985bb0127>
6. <https://www.smart-industry.net/iiot-in-oil-and-gas-industry-1-3-million-wireless-iiot-devices/>
7. <https://bit.ly/2MpMF0k>
8. <https://www.apnews.com/Business%20Wire/65bf7495625f4fb6b14bc17985bb0127>
9. Industry focused patent trends, Kilpatrick Townsend & GreyB Services (2019).
10. US Pub 2018/0080890, claim 23.
11. *Elec Power Grp, LLC v Alstom SA*, 830 F.3d 1350, 1351 (Fed Cir 2016).
12. Steve Jobs (1985).

Authors



Charles Everingham (top left) is a partner in the IP practice at Akin Gump Strauss Hauer & Feld. He is a former US magistrate judge for the Eastern District of Texas who now focuses on patent litigation.

Rehan M Safiullah (top right) is a senior counsel in Akin Gump's IP practice.

Thomas W Landers IV is an associate in the IP practice at the firm.