



Keeping drilling data safe: Cybersecurity for upstream oil and gas

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What's the story?

Many oil and gas executives have never taken cybersecurity as seriously as they should have. The

crude oil and natural gas (O&G) industry—engaged in exploration, extraction, and processing natural resources—seems like an unlikely target for cyber-attacks. Nevertheless, hackers have regularly targeted O&G companies for over 30 years, with attacks growing in frequency, sophistication, and impact, and most companies have failed to keep pace. As firms in every industry—very much including O&G—increasingly base daily operations on connected technology, risks are rising fast, along with the stakes.

Among all the upstream operations, development drilling and production have the highest cyber risk profile; seismic imaging has a relatively lower risk profile, but the growing business needs to digitize, e-store, and feed seismic data into other disciplines could raise its risk profile significantly in the future. A comprehensive risk management program that is secure, vigilant, and resilient could not only mitigate cyber risks for the most vulnerable operations but also enable all three of an upstream company's operational imperatives: safety of people, reliability of operations, and creating new value.

The upstream oil and gas industry is fast evolving, whereby automation, digitalization, and IoT technology are rapidly integrating into the complex operational ecosystem. However, the industry's march toward interconnectedness has outpaced its cyber maturity, making it a prime target for cyber-attacks. The limited strategic appreciation and sponsorship at a boardroom level—rather than lack of technical expertise—help to explain the industry's relatively low cyber maturity.

Who at my client is impacted?

- **Sector:** Primary—oil & gas
- **Roles:** Cybersecurity professionals, business leaders, C-suite executives and managers sales, innovation, operations, innovation, technology, research and development, and engineering

What issues does this address?

This article discusses major critical and risk-prone operations at various stages, which should be assessed for vulnerability to prioritize cyber investments:

- **Exploration:** this stage has low cyber vulnerability because its operations have a closed data acquisition system. Upsetting the operations would have a low probability of causing a business disruption or health, environment, and safety risk. An attack might remain unnoticed due to no direct costs or visible impacts.
- **Development:** this stage is particularly exposed to cyber incidents. High drilling activity, expansive infrastructure and services both above and below the surface, and a complex ecosystem create a large cyber-attack vector. Security teams must focus care-



fully to prevent any malware from entering the ecosystem. As with the vulnerability factor, the severity of a cyber-attack is highest in the development drilling operation.

- **Production and abandonment:** The O&G production operation ranks highest on cyber vulnerability in upstream operations, mainly because of its legacy asset base, which was not built for cybersecurity and thus, it lacks monitoring tools for existing networks. Production parameters are not as complex as other stages, allowing hackers to go for high-sequence breaches.

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Who can tell me more?

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