ARC VIEW

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Operations Excellence Takes Center Stage at TCS Energy Think Tank Event at MIT

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Summary

Tata Consultancy Services' (TCS) invited ARC Advisory Group to participate in the company's second Energy Think Tank workshop at MIT in Cambridge, Massachusetts on February 26. The workshop was held in conjunction with the two-day MIT Energy Conference (MITEC), February 27 and 28. The workshop theme was, "Operations Excellence – Engineering Led Digital Imagination."

TCS's Energy Think Tank brought together key industry participants to strategize about how operations excellence can play a greater role in today's energy industry. TCS's Energy team also exhibited deep domain expertise about operations excellence in energy-intensive industries.

Raja Banerji, Global Head - Strategic Marketing Life Sciences, Manufacturing and Energy at TCS, set the stage for the workshop by highlighting that it provided TCS with an opportunity to act as a catalyst to initiate and engage topics on innovation and provided a platform for peer-to-peer networking and exchange of best practices. TCS worked with MIT's Industry Liaison Program (MIT ILP) to bring together several MIT faculty members to present on a number of key topics including Big Data and analytics, cybersecurity, SMACIT (social, mobile, analytics, Cloud, IoT), robotics and automation, and collaboration and performance management.

Andy Chatha, ARC's president, presented perspectives on the importance that automation and the emerging Industrial Internet of Things (IIoT) play in enabling operations excellence in both oil & gas and energy-intensive industries such as metals & mining. Randall Luthi, President of the National Ocean Industries Association (NOIA), provided an overview on technology's impact on America's energy security and the potential benefits of access to the outer continental shelf in the Atlantic Ocean.

What Does Operational Excellence Mean Today?

Tom Franklin, Director – Upstream Center of Excellence at TCS, kicked off the main proceedings by tossing out the "jump ball" question for this year's workshop: "What does it really mean to run an excellent operation in today's world?" One Think Tank goal was to provide a glimpse of what may be coming over the next horizon. Franklin mentioned that it is an important time to discuss operations excellence in oil & gas since over $1 trillion has been spent over last few years in upstream investments and most of these projects have been behind schedule, over budget, and not meeting their initial production goals.

It is an important time to discuss operations excellence since the upstream oil & gas industry made over $1 trillion in upstream investments in the last couple of years and most of these projects have been behind schedule, over budget, and not meeting their initial production goals.

Safety is an imperative and oil & gas companies need to assess the potential impact their operations will have on the community, particularly the impact on public safety and the environment.

Franklin's shared a "then & now" anecdote related to one of his first projects in oil & gas 40 years ago while was working at Conoco building a gas processing plant in Wyoming. The team set an aggressive goal (for back then) to build the entire plant with a higher level of safety than was mandatory. The team ended up building the plant with zero fatalities, an experience that engrained in him a strong sense of the importance of integrity, safety first, and operations excellence.

Jan Erik Johansson, Principal Consultant at TCS, commented on the two major forces impacting energy and other industries today:

1. Time compression in operations, increased volume of data, and acceleration of innovation and technology, and

2. Many oil & gas projects operating in closer proximities to communities in which people live

To illustrate the latter, Franklin cited an example of a Marcellus Shale operator that conducted public perception surveys to develop a better understanding of why the public was not happy with its presence. The research indicated the real issue was not about hydraulic fracturing but rather the trucking log jams that were impacting parents' ability to drop off and pick up of students at school. The operator rescheduled its truck routing to

avoid drop-off and pick-up times during school days. The public relations benefits of the rerouting far outweighed the cost.

MIT Energy Conference Panel Discussions

Both Franklin and Johansson each participated in separate panel discussions at MITEC.

"Shale is not shale" in terms of heterogeneity. While it used to take three or four months to drill a well, this has been compressed down to 14 days (or less). Johansson commented that historically a company might drill 300 to 400 wells per year whereas today the well counts are in the thousands.

Unconventional Resources

Johansson served on a panel discussion entitled, "Unconventional Resources: Present to Future, US to Global." He commented that unconventional oil & gas is still a relatively young segment, with most wells only been producing for five to six years. He also explained that "shale is not shale" in terms of heterogeneity and that, while it used to take three to four months to drill a well, this has been compressed down to 14 days (or less). Also, while historically a company might drill 300 to 400 wells per year, today the well counts are in the thousands annually.

A key question posed by Johansson was: "How does the industry model this on scale and what is the need to change operating procedures and processes to achieve operations excellence?" Johansson commented that the most often overused phrase in the industry is, "This time it is going to be different." He also indicated that we do not know how long these shale wells will produce over time; however he is confident that the industry will improve production over time and extend the life of shale wells out another 30 to 40 years through operations excellence, which entails not just leveraging technology but changing the way companies operate, the way people collaborate, and the processes employed.

Technologies Reshaping the Energy Supply Map

Tom Franklin moderated the panel discussion entitled, "Technologies that are Reshaping the Energy Supply Map." He opened by mentioning that these are exciting times in the oil & gas industry, in part because of the need to be drilling in all kinds of places, many of them remote and extreme environments. Tom highlighted some key dichotomies facing upstream oil & gas:

- "Instant success after 35 years of work". Much of the technology being used today in the current shale revolution has been around for 20 to 30

years. Tom made the analogy to the Boeing DC3 which created modern aviation in the 1930s. It did this, not by using any new system or technology, but by successfully integrating all the existing technologies to enable operational excellence in aviation.

- While we're seeing the opening of exciting new energy frontiers in the Bakken and off the coast of Brazil, the most exciting recent growth has been in rehabilitating existing oil wells in the Niobrara and Permian formations.
- Good technology is available today, but much of the technology investment is being done in higher cost areas. As a result, the upstream segment is not investing enough in areas with lower operating costs. He cited Warren Buffet's analogy of "When the tide goes out, you find out who is swimming naked."
- We're seeing some unexpected consequences from deploying good technology. For example, 7 percent to 15 percent of the natural gas being produced in the Bakken and Eagle Ford is a byproduct of crude oil production.
- He provided a historical reference to his work in Haynesville shale years ago where, after time-consuming analysis, companies were able to report that their lifting cost was $7 per MMcf. Crediting the application of technology and a willingness to be innovative and resilient, operating costs have been lowered safely, with many of those wells still producing today when natural gas is ~$3 per MMcf.

Franklin indicated that the entire industry should want to be held to the higher standards used in countries such as the US, Canada, and others. He testified to get minimum regulations enforced to ensure a more balanced field of competition and that he believes transparency is in the best interest of the industry. Franklin commented that we, as part of the oil & gas industry, must understand the secondary and tertiary consequences of technologies and processes being employed, given the rapid pace of change in innovation.

Importance of Academic and Industry Collaboration

Raja Banerji, Global Head, Strategic Marketing Life Sciences, Manufacturing and Energy at TCS, kicked off the main proceedings by referring to TCS' presence in the MIT ecosystem and highlighting academia's importance as a platform to reflect prognostic thought leadership that benefits energy and other industries.

Lakshmi Srinivasan, Strategic Academic Interface at TCS, discussed disruption through innovation in B2C and B2B. He explained that the demand for modularity is increasing in B2B along with the emergence of platforms, interoperability, and product and service models. Mr. Srinivasan commented on the growing importance of increasing collaboration among academia and industry to help manage change. He also stressed that making the move into digitalization is critical. "Digital is the default" is the current mantra at TCS.

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Key takeaways from presentations made by MIT faculty include:

- "Weaponization of the Web" – system complexity is increasing faster than most companies can manage. Industrial organizations are focusing increasingly on Big Data and analytics, especially around simulation and system architecting.
- "Divide and conquer" strategies will not be effective going forward. Instead, organizations should "combine and conquer." Integration and coordination will be the way to provide the successful road map for "SMACIT" (social, mobile, analytics, cloud, Internet of Things)
- Critical needs for critical assets justify top management attention and adoption of cyber security. Organizations must define actions that are effective and can be measured and apply accident and safety research to cyber security failures to identify and disseminate best practices.
- Increase collaboration and performance management. Organizations should focus on how processes are delivered; not on the technical details and make accountability at the group (rather than individual) level.
- In robotics and automation, new robotics initiatives support using open source software for high-performance, provably safe robotics. Legislative reasons will impede full commercialization more so than technological. This is especially true in drone adoption for which demand from industry exceeds supply.

Conclusion

The TCS Energy Think Tank and subsequent MITEC panel discussions were excellent vehicles for the energy sector and energy-intensive industries alike to collaborate, share ideas, and network with academia, government, and other stakeholders.

Over the course of the event, TCS demonstrated deep domain knowledge, suggesting that end user companies could benefit from developing partnerships with companies such as TCS that provide the ability to integrate and manage complex projects that require strong engineering, IT, and operations resources. ARC also encourages companies to consider selectively collaborating with academic organizations active in appropriate technological areas.

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