

The Regulator's Perspective on Digitalization

Scott Tessier, C-NLOPB, November 19, 2019

- I'm pleased to be here today with a regulator's perspective on digitalization.
- I'd like to thank the organizers for your work in putting together today's forum as well as tomorrow's Workplace Committee session, and to thank all of you for attending and for your participation. Thanks to our Board members who've joined us today.
- I'm going to provide an overview of general considerations for regulators with respect to digitalization. Then I'll talk a bit about what we're doing internally at the C-NLOPB in this area, including some new tools for modernizing our regulatory oversight.
- It's imperative that when we discuss digitalization, we focus on safety and environmental protection.
- I've had a lot of discussions locally on this topic that have focused on efficiency and cost savings. Those are important, but when I participated in a fact finding mission to the North Sea this past June, I was struck by how over there, the digitalization discussions, led by the industry, focused first on improved industry performance from a safety and environmental perspective.
- Perhaps that's because there's an inherent assumption locally that more work being done remotely, from **onshore** is a good thing in that it means fewer people working **offshore**, with less travel via helicopter or vessel, etc.
- I believe that digitalization can and should lead to enhanced safety and environmental protection, in a number of ways.
- Of course, that only holds true if the appropriate plans are also in place to prevent or address the problems that can arise offshore, and that the people, processes and equipment for preventative and corrective maintenance and emergency response are in the right places at the right times.
- I recently had an opportunity to hear the Chair of the Board of Canada Health Infoway, Dr. Peter Vaughn, speak on innovation. He used a great line, I don't know who said it first but I'd never heard it previously. He said, "I'm not as afraid of artificial intelligence as I am of natural stupidity."
- A bit harsh perhaps, but it's certainly food for thought.

- The considerations for regulators in digitalization that I'll cover today are:
 - training and competency;
 - IT security;
 - management of big data;
 - standards; and
 - local content.
- We have a broad mandate at the C-NLOPB as you know, and digitalization presents challenges and opportunities throughout and across our organization.

In terms of training and competency...

- Even when we're all aligned on the processes and equipment involved in digital offshore operations, there will still be discussions about how we can be satisfied that the people behind those processes and equipment are competent.
- We already worry about broader training and competency issues as the industry rebounds from the downturn.
- Skilled workers are in demand everywhere. Competition for skilled workers in the offshore petroleum sector has once again heated up.
- And in the digitalization space, the competition is no doubt particularly fierce, within the sector and across today's economy.
- There's also a local content lens on this, as part of our regulatory mandate is to ensure optimal use of a local workforce.

On IT security...

- When you look at digitalization, you also have to look at the safety implications through the security lens. A cyber security breach can lead to a safety event, just as a physical incursion could.
- Cyber-attacks on critical infrastructure and the oil and gas industry are on the rise and it has been said that “every point of connectivity, is a point of vulnerability”.
- In 2017, Saudi Aramco was cyber attacked with the ultimate goal of causing an explosion, which fortunately failed. But it did result in 30,000 computers being compromised.
- Saipem has also been the victim of a cyberattack that affected its servers in the Middle East and Aberdeen. Luckily there was no loss of data, but servers needed to be shut down until back-ups could be safely brought online.
- So, cyberattacks in the oil and gas industry happen and it would be foolish to think that no matter how isolated we are in Newfoundland and Labrador, remote areas of eastern Canada are somehow immune.
- Fortunately, industrial control systems (ICSs) have evolved:
 - from being analog and built for purpose and for local use, and not connected to other systems or the internet;
 - to systems used to monitor and control processes locally or remotely, interconnected with other systems;
 - and more recently, to everything increasingly getting connected to everything else, which includes some older, legacy systems.
- This is one area where more needs to be done -- to ensure that the proper risk assessments are completed before systems are connected.
- As I'll discuss in a moment, standards have not kept pace with the innovations here and in some areas, standards are non-existent.
- We may never be able to get ahead of the technology trends, but if we develop best practices and guidelines before we implement new devices, software and systems, that will help so that we don't leave ourselves as vulnerable as we otherwise would be.
- So what can we do to protect ourselves and the information that is swirling about?
- Collaboration is key -- keeping an open dialog and knowing what's coming in the near future will allow for better understanding of technology and the potential risks.

- Operators, regulators, vendors, governments and academia that are engaged in the offshore oil sector should work collaboratively to develop cybersecurity criteria and standards that best suit unique circumstances.
- I'll also put a plug in for Canada's National Cyber Strategy. The C-NLOPB falls under the Natural Resources Canada Critical Energy Infrastructure umbrella.
- In the spring of 2018, the federal government announced the National Cyber Security Strategy and allocated \$500 million for cyber security initiatives. Along with this came the Canadian Centre for Cyber Security, which will be open to collaboration with industry as well as academia.
- The Strategy's focus areas are Security and Resilience; Cyber innovation; and Leadership and Collaboration.
- Canada has also committed to leading the G7 in cyber security for digitalized energy infrastructure systems.

Which brings us to data management...

- As the curator of data under the *Atlantic Accord Acts*, the Board has a particular stake in the management of big data.
- Digitization and digitalization come with vast amounts of data, not necessarily in formats that easily facilitate analytics.
- There are various data types and submission requirements laid out in the *Accord Acts* with regard to the geological and engineering data that we require and curate.
- We need to assess whether there are other data types not currently covered under the *Acts* that would be in the public interest for the Board to collect?
- It is currently fairly black and white as to what data is privileged and what data is available for public release.
- But as "new" data is created that is not specifically mentioned in legislation, there will no doubt be challenges to what information the Board has authority to curate, and what can or should be made available to the public.
- As data sets become larger, the time and resources required to effectively manage them also increase.

- The last five to seven years have seen large increases in the number and size of seismic data sets acquired in the offshore area. All of these seismic data sets are curated by the C-NLOPB. The digital storage space required to manage these data sets has grown exponentially. To help manage the variations data submission sizes, the C-NLOPB has adopted new infrastructure for storage space.
- But we have more work to do to prepare for management of data sets generated through digitalization, which is challenging for a public and at times resource-constrained organization that regulates a very private, competitive and innovative industry.
- As digital data grows, there is of course higher demand on IT infrastructure to support the storage and transfer of that information.
- A question for everyone is whether Newfoundland and Labrador’s IT market and infrastructure pose any unique challenges that aren’t experienced elsewhere (things like network speed, access and cost). We seem to be doing really well in other sectors when it comes to IT-related innovation.
- The demand for “regulated information” is also increasing, with understandable expectations that we will fill requests for information faster and in modern formats.
- In tandem with an upgrade to our data management system, the C-NLOPB is currently reviewing data disclosure formats, ensuring we are releasing the most user-friendly formats within the confines of the Accord Acts.
- Data standardization will also become more important in the management and use of data.
- And as cloud-based technology becomes mainstream, we need to weigh access to public information and security of confidential information.
- So what about the **opportunities** of data management for regulators?
- During the last year, the C-NLOPB has taken strides towards operating as a paperless office, adopting more electronics means of operation. Initiatives have included implementation of electronic signatures, piloting of some Board processes to run digitally and increasing adoption of our digital records management system.
- To enable this transformation, the Board held an “Information Management Day” this summer where all staff participated in an effort to reduce their “paper footprint” and increase the amount of information available through electronic records management systems. That resulted in the secure shredding of 4500 lbs of paper!
- To facilitate modern submission of information and data collected through exploration and production activities, the Board updated our Data Acquisition and Reporting Guidelines and our

Geophysical, Geological, Environmental and Geotechnical Program Guidelines to remove the requirement for paper and update the electronic forms of submission.

- During the last year, we also conducted an assessment of our data management system and practices. A project is underway to transition to a user-friendly GIS interface for the viewing and access of released technical data including seismic and well information.
- Internal assessment is ongoing with a staged implementation plan to progress through 2020 with the long term goal of public access online. This is a complex project as significant emphasis is being placed on security, privacy, confidentiality, and all other related regulatory sensitives.
- Being the common data repository (for regulated data) could help in ensuring widespread access to safety critical information for operators in the Offshore Area, as opposed to silos or pockets of information.
- There is an opportunity to utilize digital data to produce industry-wide metrics and analysis. This will enable identification of positive and negative trends and areas of focus in our offshore, regionally and even internationally.
- The Board has over 30 years of experience managing a variety of information types from many sources. That experience can be carried forward as new types and new volumes are generated through digitalization.
- We also have 30+ years of experience managing commercially sensitive data sets and information, which will serve us well in managing the data sets generated through the digitalization process, which will be commercially sensitive.

Which brings me to standards, which regulators typically cherish because they can help makes our jobs simpler when they are done well...

- Generally, industry standards follow widespread use of a technology. So for leading-edge innovations, specific standards often don't exist.
- It is only when issues arise from adaptation of new applications or from their widespread use that standards are developed and formalized.
- Remote controls and monitoring are not new concepts, and standards have developed as their use becomes more widespread.
- When operators present new technologies to us for use in the offshore area, the absence of standards complicates and lengthens the process of determining whether or not regulatory objectives are met.
- So in the absence of standards, someone will need to design a process that demonstrates to our satisfaction that new technology and digitalization initiatives are safer and offer better environmental protection.
- The path to regulatory approval involves us understanding the diligent assessment and testing that an operator has carried out to identify the limitations of a tool, as well as its potential risks.
- That approval process might involve field testing, a qualification process, training and competency, and risk assessment, including new risk exposure such as cyber security.
- We should all agree that in solving one problem through innovation, we can't introduce an undue degree of risk or create new problems.

And last but not least, there's local content...

- Again, it seems as though there's no good reason for Newfoundland and Labrador to not be well situated in this area from an Industrial Benefits perspective – here I'm talking about employment, procurement, R&D and E&T, and diversity.
- The industry needs to play a large part in ensuring that local capacity exists to fulfill future labour needs, by anticipating required skill sets and working to ensure the labour force is trained and competent in advance of the need.
- Consideration should also be given to opportunities for digitalization to help transform local markets and make them more globally competitive, perhaps by using local companies to help develop and adapt new technological solutions.

- These two points should be considered through a “supplier development” lens, which could otherwise be overlooked when emerging technologies are being presented by established, foreign suppliers.
- Fibre-optic connections to platforms offer transformative potential for operations and maintenance activities and facilitate greater leveraging of emerging technologies – without concerted effort, the path of least resistance could simply be to use foreign suppliers and contractors that have developed these innovative technologies.
- Operators should consider how they can influence the choice of vendors and encourage consideration of, and developmental support for, local companies also working in this space.
- This may be true not only for hardware/software developments, but also for data analytics and other digital services such as consulting, data storage, communications, etc.
- Automation and remote operations have many benefits operationally and could greatly improve safety, but from a local content perspective it is important to not lose sight of the Atlantic Accord’s legislative requirement for “appropriate levels of decision-making” to take place within the operator’s local office. Digitalization and remote operations being controlled from outside the province or the country could conceivably bring operators into non-compliance with this provision.
- We see the R&D spending obligations as an ideal vehicle for operators to leverage the local capacity in the digitalization of the industry.
- Local technology and oil and gas industries can be leveraged to create local, exportable solutions.
- Our IT community, oil and gas industry, industry associations and research institutions all have skill sets that are, at once, world-class and unique to Newfoundland and Labrador.
- And, last but not least, digitalization provides great opportunities for diversification and inclusion. Jobs that were traditionally done offshore that could be transferred onshore create opportunities for those who previously would not have been given clearance to work offshore. Particularly individuals with disabilities.

Related C-NLOPB Initiatives...

- I’ll close by talking about some additional things we’re doing, beyond paper reduction and data management, and considering internally to address the challenges and seize the opportunities of digitalization.

- We are being opportunistic in learning from the industry, here and around the world, while being conscious of the importance of our independence.
- We enjoy excellent technical networks among our regulatory counterparts, as Canada (the C-NSOPB, the C-NLOPB and Canadian Energy Regulator) chairs the International Regulators Forum over the next three years. These networks include the HSE in the UK, Norway's PSA, BSEE in the U.S., NOPSEMA in Australia, and the Danish and Dutch regulators.
- This past June, we had a productive two day meeting with the PSA on their experience with digitization in the Norwegian Centennial Shelf.
- When our staff travel, they're expected to take advantage of opportunities to meet with and learn from their regulatory colleagues and their industry counterparts.
- We've also been working to develop an in-house Safety Oversight Management Information System, with a view to digitizing, digitalizing, streamlining and automating some of our internal and external processes.
- This will reduce the amount of paper records and e-mail we use, and improve the quality and standardization of safety information that is submitted and curated.
- Phase one of this project is nearing completion and will see our incident reporting process re-vamped to allow operators to submit information in real time through an online portal. The data that is collected in the system will produce safety statistics and trends almost instantly, which will help inform our safety professionals' determinations of areas of risk.
- The next phase will involve our audit/inspection, and safety assessment processes. This module will allow our Safety Officers and others to create punchlists and reports and submit them to operators online. We hope to go live with that in the Fall of 2020.
- Through workflows, operators will be sent tasks to be completed within a determined timeline and the system will also allow them to submit responses online to address and close out items in a more time-efficient manner.
- We have been progressing direct user account access to Certifying Authority programs to enable more immediate and efficient visibility to their verification activities and reports.
- We have also been working with operators and facility owners in the areas of Drilling and Completions and Production Operations, including the potential use of "digital twins". This covers everything from "drilling wells on simulator" to drill-floor automation technologies, to remote operations, to digital replicas of facilities, to simulator training and onwards – the potential is extensive.

- Our well approvals and authorizations processes have now been converted to fully digital processes, and we continue to expand our scope of data for key metrics trending and to evolve our use of digital tools to help automate the extraction of that data.
- Future processes will continue to be automated within the C-NLOPB, which will reduce our workload so we can focus more on oversight and areas of improvement throughout the offshore industry.
- Which is a good segue to performance-based regulation...
- Many in this room are familiar with the regulatory reform work being led by governments, with an advisory role provided by the regulators.
- In some ways, it's daunting to be moving down this road, while working on digitalization, while transitioning from a downturn to an uptick in offshore activity.
- The C-NLOPB will continue to work our change management plans over the next year in preparation for this new suite of regulations, including the development of modern guidance.
- We have been undertaking sessions with operators, contractors and service companies on near-term and long-term thinking, about new technology approaches that they are pursuing.
- In doing so, we will be proactively considering how digitalization can be applied to the applications, information and reports we receive from operators, and how we can digitally upgrade and ideally transform our internal processes and systems.
- And on that note, I'll close by extending an offer and an open door to any operator or others interested in trying some new approaches in areas such as our applications processes, data disclosure or industry-wide metrics.
- We feel that some good low-risk pilot projects would be useful in demystifying digitalization.
- Thank you for the opportunity to present this morning, and I look forward to your questions.
- I will also be participating in this afternoons digitalization panel and look forward to a productive discussion at that time.