Clearing Benchmarks

DEFENDING VALUE – Protecting NGC's assets

The basic principle of market exchange is trading one thing of value for another. If we want to earn money, we must have something equally valuable to trade for it. In NGC's case, since the Company must purchase the natural gas it sells, it cannot earn profits from the sale of gas without first adding value to increase its worth. NGC achieves this through its services, which include gas aggregation, processing (via subsidiary Phoenix Park Gas Processors Limited), transportation and distribution.

If we grant that this added value is what feeds NGC's earning potential and profitability in the area of gas merchandising, it is clear that the assets that enable the Company to deliver these value-adding services are its true source of wealth. For NGC, these include (inter alia): its infrastructural capacity, skilled leaders and human capital, digital assets and intellectual property, high operational standards, brand equity and social licence to operate.

These engines of value allow the Company to generate income for itself and for the country. For this reason, NGC's success and sustainability rely heavily on its ability to safeguard them.

Within the organisation, several teams work together to deliver this critical function – the defence of value. Leading the way is the Health, Safety, Security and Environment (HSSE) Division, though it is ably supported by the work of other groups such as Operations, Corporate Communications and Engineering. The teams are notably making use of best-in-class tools, standards, and practices to ensure NGC's value-generating assets are protected.

SAFETY

Safety is one of the foundational pillars of NGC's business strategy, and with good reason. Safety is fundamental to operations as employees would be unable to execute their duties in unsafe environments. Unsafe conditions or behaviours could also precipitate network issues and service disruption to customers, with knock-on effects on the economy.

Moreover, as an energy company piping a potentially flammable substance through populated and environmentally sensitive areas, the adoption of best-in-class safety standards and practices is what grants NGC its licence to operate. The public would not tolerate a business whose infrastructure and operations threaten personal well-being, property or the environment.

Defending Value – Protecting NGC's Asssets | CONTINUED

Managing asset integrity is crucial from both safety and value-preservation perspectives

On another level, as NGC grows beyond its core business and looks to market its expertise to nascent gas territories, a strong safety reputation is a major selling point. New operators would not want to engage the services of a company whose operational ethos does not value stakeholder well-being.

For all these reasons, for NGC to successfully expand its business and grow its value, it must ensure that safety is reinforced, in much the same way a contractor would need to ensure the foundation of a building is strong enough to support any planned extension. Himalaya Boodoosingh, Senior Manager HSSE, notes that NGC's HSSE strategy is reflective and supportive of the organisational vision to become a leader in the global energy business.

At NGC, safety can be broadly viewed through the lenses of infrastructural integrity, process safety, emergency response and personal safety practices or behaviours.

Asset Integrity Management (AIM)

NGC's 1,000km pipeline network is its most valuable physical asset. However, at the same time, it is also a liability, as its expanse, geographical spread and age introduce different degrees of risk – integrity issues could arise that could lead to release incidents, service disruption, or even endanger communities. Management of this network, a function of the Operations Group, is therefore crucial from both safety and value-preservation perspectives, and NGC has dedicated teams who monitor and maintain the pipelines and associated facilities.

NGC redoubled efforts in AIM in direct response to a National Facilities Integrity Audit that was conducted in 2015 by international firm Det Norske Veritas (DNV). This audit, which investigated over 30 local companies, assigned NGC a score of 1.79 (for Systems' evaluation), below the national average of 2.02. NGC then undertook an aggressive remedial campaign on its equipment and systems to address concerns raised by the auditors and managed to raise its score above the national average.

The organisation has since begun to focus on bringing its AIM capability in line with best-in-class standards. To keep the Company accountable, AIM has been pegged to its corporate scorecard, so that work in this area is taken to be a key performance indicator. As part of the wider NGC Group, an AIM Steering Committee was also formed, which provides the platform for sharing best practices, methodologies and technologies.

In 2019, NGC adopted a new AIM Framework based on 10 functions, aligned with ISO 55000 Standards in Asset Management. This framework is built on four main pillars:

- Leadership and Governance
- Administrative Management Systems
- Technical Management Systems
- Functional Execution and Performance

This framework specifies the requirements for an effective asset management system and integrates AIM with other business areas such as human resources, governance, technical document management and supply chain management.

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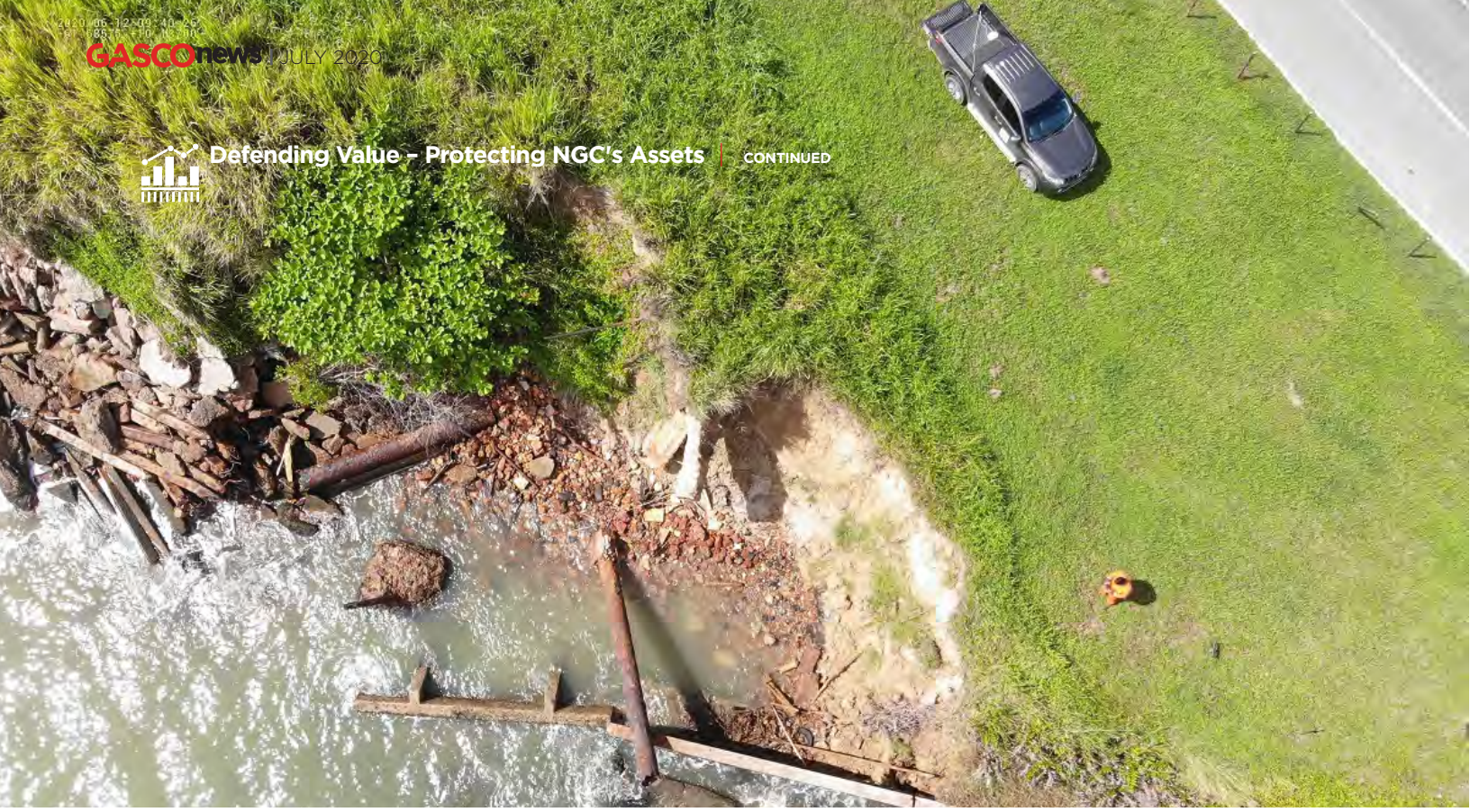

Drone surveillance is used to monitor land movements, such as landslips, which could compromise pipeline integrity

Maintenance Automation

One key function of the AIM Framework where significant strides have been made is in the area of Information Management, with the computerisation of maintenance planning and scheduling. Through the Computerised Maintenance Management System (CMMS), NGC has made great progress with planning and scheduling preventative maintenance works on NGC's manned facilities and generated valuable data to streamline maintenance performance in the future. The Tobago Gas Receiving Facility was the first asset to be completely integrated into this system.

Risk-Based Inspection

In 2019, in line with the overall goal of reduced risk to operations, NGC began transitioning from a traditional time-based asset inspection programme to a Risk-Based Inspection (RBI) programme. This best practice approach focuses on reducing risk by channeling resources and priorities towards inspecting assets in areas that are high risk and more prone to failure. The transition to RBI is expected to be completed in 2021 for all gas receiving facilities and valve stations.

Technology

Technology is also being integrated to help sustain best-in-class capability in the maintenance function. A specialist drone has been drafted into use, capable of carrying payloads such as infra-red cameras, Light Detection & Ranging (LiDAR) sensors and gas detection sensors, all of which can aid in asset integrity efforts.

Exploration of applications for Extended Reality technologies, which can assist with work planning, scenario modelling, emergency response training, and even virtual tours for visitors, is in progress. These would reduce the exposure of NGC's infrastructure to the risk of third-party interference, and the exposure of people to the inherent risk in its operations.

Process Safety

It is one thing to have sound infrastructure, and quite another to have safe operations. Between one and the other, lie the work processes and procedures that are used by employees in the execution of their duties.

Process Safety Management (PSM) is the management and mitigation of risk of chemical process incidents due to failures of technology, human errors, management shortcomings, external circumstances, or natural events. PSM, and more specifically Risk-Based PSM (RBPSM) is a core focus area for NGC.

In the April 2020 issue of *GASCO News*, it was reported that NGC principals, including its Vice President of Operations Ramesh Harrylal, played a seminal role in the publication of new Centre for Chemical Process Safety (CCPS) guidelines that will help companies around the world manage operational risk in times of crisis. These guidelines included insights from NGC's own experience of risk management during the COVID-19 pandemic. The inclusion of NGC's experience in an international Process Safety guidebook distinguishes the Company's PSM strategy as utilising best-in-class, exemplary approaches

NGC is looking to strengthen its emergency response mechanisms through closer partnership with TTEMAS

worthy of emulation. It is a notable instance of NGC setting the bar for the global industry.

Not falling into complacency, NGC is looking to further strengthen its PSM capability. The Company is pushing for the full adoption of CCPS guidelines into operations across the NGC Group. It is also seeking to leverage its membership on the CCPS Committee to get ten (10) staff members certified in PSM. Such asset development will help cement NGC as a leader in PSM, and strengthen its value proposition to current and potential business partners.

Emergency Response

Even with robust systems in place to prevent operational incidents, NGC has implemented emergency response mechanisms for activation in the event of dangerous releases, natural disasters, health crises and the like which could affect its stakeholders. Given the national footprint of its network and the support that would be needed to respond to non-localised emergencies (eg. widespread infrastructural damage due to a hurricane or earthquake), NGC is looking at closer integration with the Trinidad and Tobago Emergency Mutual Aid Scheme (TTEMAS). Building this partnership will greatly enhance the Company's response capacity, and maximise the resources that can be mobilised in the event such need arises.

Within the organisation, measures are being implemented to bring emergency response procedures in line with best-in-class standards. A virtual Emergency Operating Centre (EOC) is being created that will enable faster team mobilisation and enhanced communication across the NGC Group. A contract has also been signed for delivery of a mass-distribution SMS service to send alerts and updates directly to all employees during emergencies.

These emergency response mechanisms dialogue with the Company's Business Continuity Planning (BCP) protocols, which aim to keep operations going in the event of a destabilising emergency.[1]

Personal Behaviours

The fourth prong of safety is personal behaviours and practices. If employees are not committed to the principles governing safe operations, the risk of job-related incidents surges. To cultivate a strong safety culture and heightened awareness within the organisation, NGC has introduced a number of performance hurdles tied to safety into employee appraisals. Staff must complete mandatory training modules on Process Safety and Life Saving Rules as part of their annual performance plans. Mechanisms such as 'Let's Connect' conversations and Workplace Inspections are also utilised to keep safety top of mind.

[1] Read more about NGC's BCP team and its COVID-19 activities in the April 2020 issue of *Gasco News.*

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HEALTH

Employees constitute a frontline value-generating asset for NGC. Ensuring their physical and mental wellness is, therefore, a key focus of the organisational strategy. Routine initiatives spearheaded by the Human Resource Division encourage employees to pursue a healthy lifestyle, make free medical screenings available, and seek to promote work-life balance.

At the onset of the COVID-19 pandemic, safeguarding employee health became a primary business concern, and steps were taken accordingly. In keeping with local and international guidelines, non-essential staff was asked to work from home, while frontline workers were properly outfitted with Personal Protective Equipment (PPE). Sanitisation efforts were ramped up across facilities, as were communications around proper hygiene and safety practices.

With restrictions eased, new protocols have been implemented to re-introduce staff into the office on a phased basis. Temperature checks and health declarations are mandatory preconditions for entry into facilities, contactless doors and bins have been introduced, and social distancing will be enforced through spatial reconfigurations, room occupancy limits and mandatory masking at certain distances.

NGC will continue to monitor and be guided by local and international developments with regard to the pandemic. The Company has taken the position to keep protective measures in place until a vaccine becomes available.

SECURITY

The third pillar of HSSE treats with the security of assets. Whereas AIM focuses largely on protecting assets against deterioration and damage from natural causes, the Security function seeks to protect assets against malicious interference.

To make infrastructural assets more secure, NGC is expanding its surveillance capability with the installation of first-rate CCTV cameras at its facilities, and motion detectors to alert operators of any intrusion.

To strengthen personnel security, the Company is moving towards the installation of a full-body and handheld scanner facility at Head Office. This will further enhance access control capabilities for all personnel and visitors entering the facility. The space will be outfitted with a training room and a secured area for the storage of arms and ammunition during state and executive visits.

In the digital age, any security strategy would be incomplete without addressing cybersecurity. As more

Cybersecurity has now been subsumed under the traditional Security portfolio

resources and functions become digitised, a significant proportion of NGC's value-generating assets now reside in a virtual space. Threatening these assets are wide-ranging species of intrusion tactics, malware and viruses.

In recognition of the evolving risks that present in the digital space, and the need for constant vigilance, NGC decided to integrate the Information Security function under the HSSE Division. This move to combine cybersecurity into the traditional Security portfolio is a pioneering move among local state companies. Not only does it rightly ascribe increased importance to the protection of digital assets, but it reflects the progressive thinking that underpins NGC's growth strategy.

ENVIRONMENT

As stated earlier, one of the elements enabling NGC to carry out its business and create value is its social license to operate. In today's business climate, consumers demand that companies demonstrate a commitment to corporate social responsibility. While this subsumes such principles as philanthropy, fair business practices and social justice, the near-universal ask of companies is environmental care and consciousness.

In defence of its licence to operate, NGC, spurred on by Corporate Communications, adopted a principle of 'no net loss', which committed the Company to replant hectares cleared during pipeline construction activities. In 2018, it undertook a carbon sequestration study to measure the carbon impact of its large-scale reforestation programme begun in 2005. In the national energy efficiency and renewable energy spheres, NGC and the wider NGC Group have assumed a leadership role as a lobbyist for clean energy.

The most recent project being undertaken turns attention to measuring and reducing the Company's methane emissions. A potent greenhouse gas, methane is calculated to be "about 28 times more powerful than carbon dioxide at warming the Earth on a 100-year timescale, and more than 80 times more powerful over 20 years."[2]

Methane is the primary component of natural gas. Natural gas venting and leaks along the gas production and supply chain can, therefore, be a significant contributor to methane emissions. It is incumbent on operators such as NGC to closely manage their operations, maintenance and asset integrity to reduce the likelihood and incidence of natural gas releases and leaks on their infrastructure.

The expanse and complexity of NGC's infrastructure present ample opportunity for leaks to develop. Currently, NGC uses a Supervisory Control and Data Acquisition (SCADA) system to monitor gas flow and pressure in the pipeline network for any variation that would indicate major leaks in addition to gas detectors at strategic locations. Routine manual inspections and maintenance of infrastructure is simultaneously used to identify minor leaks that would not be detected through SCADA and installed gas detectors.

These systems notwithstanding, the possibility of methane escaping into the atmosphere through minor leaks still exists, especially in installations and facilities where pipelines are fitted with many valves, joints, fittings and couplings, such as the NGC gas receiving stations and plant environment of Phoenix Park Gas Processors Limited (PPGPL).

In an effort to further reduce the incidence of such leaks, NGC has decided to invest in an optical and infrared camera capable of detecting and visualising fugitive hydrocarbon emissions from the gas infrastructure. This technology has been used with great effect in other world-class facilities, and will allow NGC and the wider NGC Group to close in on its operational target of near-zero methane emissions. The camera is expected to be integrated into work processes across the Group in the coming months.

Besides allowing NGC to rein in methane emissions, this camera would also help the Company increase the safety of its installations, as undetected leaks could result in process safety incidents, causing injury to personnel or endanger communities and property. Leak detection would also help reduce the number of gas molecules lost in transit through the network, which in times of tight supply, is an important function to conserve value.

Alongside this purchase, NGC will be working with the University of Trinidad and Tobago (UTT) to measure its methane emissions. This will help the Company to track progress towards its emissions target, and allow for greater transparency and accountability from a reporting standpoint.

ENABLING THE VISION

NGC and the wider NGC Group are intent on evolving, as the industry, and indeed the world, evolves around them. That change and growth must be anchored in a solid foundation - there can be no launch without a platform. Accordingly, the HSSE and all supporting teams across the Company stand committed to defending the advance of the organisation, by safeguarding its foundational assets and the trove of value it has built over four and a half decades. ■

[2] https://www.nationalgeographic.com/environment/global-warming/methane/