

SUSTAINABILITY REPORT

2019-20



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A MESSAGE FROM THE MANAGING DIRECTOR

It gives me an immense sense of satisfaction to share HOEC's Sustainability Report for FY 2019-20. This report covers HOEC's efforts to work in tandem with the environment, as well as to ensure the safety and welfare of all stakeholders and local communities in its areas of operation. The company is committed to grow in a responsible manner and realizes the role that Health, Safety and Environment best practices play in all successful corporate initiatives, in addition to being a statutory requirement. The company's objective is to comply with all relevant legislations and requirements while carrying out oil and gas Exploration & Production (E&P) activities, in line with the commitments undertaken with the Government of India. Stringent environmental compliance and comprehensive safety practices are foremost priority in the company's operational and growth strategy.

The company is engaged in activities where a certain level of risk is unavoidable. However, through the development and execution of detailed training programs, effective standard operating procedures (SOPs) and risk management, we strive to achieve minimal impact on environmental resources, and maximum workplace safety. All commissioned operational activities are preceded by thorough environmental and social impact assessment studies. This process involves identifying and evaluating all potential impacts, and subsequently devising adequate controls and mitigation measures to reduce the risks associated with the company's E&P activities.

At the Board level, there is a Risk Management Committee that is headed by Mr. P.K. Borthakur (Independent Director on the HOEC Board and Former Director Offshore, on the Board of ONGC). There is also a Board level Corporate Social Responsibility Committee



P. Elango
Managing Director

headed by Mr. Vivek Rae, Chairman of the HOEC Board and Former Petroleum Secretary to the Government of India. These two committees provide strategic direction and oversight to all our sustainability initiatives and programmes.

At an operational level, the firm has established a Health, Safety and Environment (HSE) Committee to ensure that all relevant safety and environmental compliance requirements are being adequately followed. An HSE Management System is in place and is deeply rooted within the respective site management teams. This system serves as a guideline for applicable best practices. All contractors and outside personnel working with HOEC are held accountable to follow this system with the same vigilance as HOEC's employees.

Furthermore, considering the acceptance that local communities give us in our operating areas, as responsible corporate citizens, we hold ourselves strongly accountable to provide them with the tools and resources necessary to improve their quality of life. The company has taken up various projects including development of educational infrastructure, installation of solar street lamps, construction of street roads, and hosting of career guidance workshops and women empowerment programs in its areas of operation.

HOEC's Board and Management shall continue to undertake the responsibility to consistently reinforce the concept of sustainability in all its business decisions, and to champion the company's ambition to conduct business in that manner. We are committed to continuously enhance our business practices to effect positive change, and to enable HOEC to stand at the forefront of the oil and gas companies operating in India.

HOEC is aware of its responsibility towards creating a positive socio-economic impact on local communities. Preservation and protection of the environment are of primary importance, right from the initial planning

phase of any project to the design, engineering and technology adopted during execution, thereby delivering holistic value to all our stakeholders.

The on-going COVID-19 Pandemic has inhibited global economic growth and transformed business strategies significantly. In India, the oil and gas Sector is among the worst hit and has caused HOEC to re-align its approach. With the adoption of new strategies and the guidelines issued by the Government of India, HOEC has built a formidable foundation to sustain its business during these testing times.

Before I conclude, I wish to acknowledge the contributions made by Pranay Kejriwal (Trainee - Strategy), Dev Aravind S R (Business Analyst - Strategy) and Janakiraman G (Head - HSE & CSR) in the preparation of the Sustainability Report for FY 2019-20.

Sincerely,



P. Elango
Managing Director



I Introduction

Sustainability is at the heart of HOEC's decision making at all levels. Employees are encouraged to solve problems in a methodical manner while strictly abiding to HOEC's sustainability principles. The design of any proposed solution must ensure minimal impact on the environment and the socio-economic conditions of the area.

HOEC's sustainability policies are devised to enable smooth execution of daily operations by leveraging latest technology, to ensure growth and profitability.

I Reporting Guidelines

This report is a culmination of information gathered from various internal company documents, site assessments, systems and practices, Standard Operating Procedures, Standard Maintenance Procedures and various technology adoption & engineering controls being followed at site level.

The information on the impacts of flaring has been segregated into two categories:

- i) Flaring during the Testing phase (Subsequent to Drilling, which lasts about 4-5 days)
- ii) Flaring during regular production (Usually in a small quantity as it is not economically viable to process or store)

The details of (i) are included in the 'Drilling Practices' section and the details of (ii) are included in the 'Gas Flaring' section. Information for the 'Gas Flaring' section has been extracted from energyeducation.ca, an energy education website associated with the University of Calgary.

Company Overview

Since its inception in 1983, HOEC has been on a mission to create meaningful impact across the oil and gas value chain. The company's rich history establishing itself as India's first private oil and gas exploration company, has laid a solid foundation for it to continue striving towards its goal of transformation through talent and technology.

However, the management understands that this growth needs to continue in a responsible manner. To ensure this:

- HOEC strives to utilize degraded or low-value land to the best of its ability for the execution of its projects
- HOEC tasks third-party organizations with carrying out Environmental Impact Assessment (EIA) studies on its behalf to analyze the environmental and social implications on the surrounding areas like ambient air, ground water, surface water, soil quality & emissions etc. due to its projects
- The company also participates in the public hearing process that forms part of the EIA study, and does its best to address the concerns of the local community, as well as to mitigate any potential threat from its operations that could affect the healthy functioning or livelihood of the community members
- All designing and project planning is done in a way to minimize environmental damage, and all procured machinery is assessed to ensure that it complies with desired environmental & safety standards
- HOEC monitors various factors at all worksites to ensure minimal environmental & social impact:
 - **Air Quality:** Periodic ambient air quality monitoring is conducted in accordance with an Environmental Monitoring Program
 - **Noise Management:** Low noise generating equipment equipped with engineering controls such as mufflers, silencers etc. are deployed at all worksites with preventive maintenance being carried out periodically for the same

- **Soil Quality Management:** Periodic monitoring of soil quality is conducted in accordance with an Environmental Monitoring Program. Fuel, lubricants and processed chemicals storage areas are paved and adequately bunded to accommodate any spill
 - During the planning phase of any project, HOEC believes in selection of degraded/Non-agricultural land for its project execution
- **Surface Water Quality Management:** Regular monitoring of surface water quality is conducted in accordance with an Environmental Monitoring Program. Sediment filters & Oil-Water interceptors are installed to intercept run-off and remove sediments before it enters any water course
- **Ground Water Quality Management:** Regular monitoring of ground water quality is conducted in accordance with an Environmental Monitoring Program. Water based mud comprising of low toxicity chemicals/additives is used as drilling fluid to ensure minimal ground water contamination
- **Waste Management:** Protocols for storage and disposal of drill cuttings and waste mud are made in accordance with a Solid & Hazardous Waste Management Plan
- Third-party agencies are periodically tasked with monitoring emissions at site level
- All Health, Safety, Environment, socio-economic, local community concerns and related issues are incorporated and addressed during hookup & commissioning of new installations, routine operations and regular logistical facilities for both, onshore and offshore
- HOEC has a robust Emergency Response Plan (ERP) for production operations, Drilling Campaigns and project execution activities to respond swiftly during any emergency
- Risk assessment studies are conducted for critical activities and safe operating procedures are developed to control identified hazards
 - Risks associated with onshore Drilling Campaigns include oil spills, loss of well control/blowout, process leaks and high well pressure & temperature

- Risks associated with offshore Drilling Campaigns include oil spills, loss of well control/blowout, process leaks, high well pressure & temperature, presence of high concentrations of CO₂ & H₂S and transportation of personnel & equipment via helicopter

Brief Overview of HOEC's Asset Portfolio

HOEC currently has 11 Blocks across India and 6 producing Fields (including Kharsang) with a gross average production of **7,869 BOEPD** and a net average production of **3,163 BOEPD** during FY20. This includes both oil and gas producing Blocks spanning Assam, Cauvery, Cambay and Bombay High regions.

The organization is committed to swiftly monetizing its discovered resource portfolio. The company's key areas of focus are as follows:

- **Onshore**

- North-East – Dirok, Kharsang, Kherem & Umatara
- Cambay – Palej, Asjol & North Balol

- **Offshore**

- Cauvery Offshore – PY-1/PY-3
- Bombay High – B-80

North-East

With the acquisition of Geopetrol International Inc., HOEC now has interests in 5 Blocks (Dirok, Kharsang, Kherem, Umatara & Greater Dirok) in the North-Eastern States.

Kharsang

The Kharsang oil Field is located in the state of Arunachal Pradesh, 60 kms away from Dirok Field. HOEC acquired the entire share capital of M/s Geopetrol International Inc. in 2018, which has 30% stake - Direct and Indirect in the Kharsang Field.

- The current production is about 650 boepd and upon completion of the 18 proposed wells, the production is expected to increase to about 1,800 boepd
- Forest Clearance and Mining lease approval have been obtained and the PSC extension is awaited

Kherem

The Kherem Block was awarded under Discovered Small Field Round in 2016, with HOEC having 40% Participating Interest. The wells were tested for oil and found to be producing 402 bopd. The Field Plan includes drilling of 2 wells that would be completed within 3 years from date of receipt of the PML.

- The applications for Forest Clearance and PML are under process

Umatara

The Umatara Block was awarded to HOEC under Discovered Small Field Round in 2019, with the company having a 10% Participating Interest. This Field is located at a distance of about 50 kms from the Dirok Field and is jointly operated by IOC (Lead operator) & HOEC.

Dirok

In Dirok Gas Field, six wells have been drilled, and production from them has commenced. A Gas Gathering Station (GGS) has been commissioned to collect the gas that is produced. A Modular Gas Processing Plant (MGPP) has also been commissioned to process the produced gas. The different modules of the MGPP were fabricated and tested outside and transported to the site. They were assembled at site within 3 months for production. By adopting this approach:

(i) Design to construction time reduced from 24 months to 12 months, thereby reducing noise pollution; (ii) land utilization reduced drastically, especially for the plant area; and (iii) the site can be restored very quickly when required, as the modules are easily removable. The MGPP can process up to 35 mmscfd of gas and 800 BPD of condensate currently, with plans to increase to 55 mmscfd after completion of Dirok Phase-II. The company has now firmly established its position as the largest private producer of oil and gas in this region. Owing to the huge amount of annual rainfall, forest types occurring in this region are primarily Tropical Evergreen Forest and Tropical Semi-Evergreen Forest. A conscious effort has been made to ensure that none of the wells, as well as the GGS is located in an area that would cause disturbance to the surrounding tea garden, forestland or wildlife.

The initially proposed pipeline (from GGS to MGPP) was passing through the Golai-Powai Elephant Corridor near Golai village. The elephant corridor was also located in proximity to one of the proposed MGPP locations. HOEC therefore, identified alternatives to the MGPP's location, and committed to siting it outside the elephant corridor. The pipeline is 21 km long, and is laid 1.5 metres below the ground to minimize footprint in the eco sensitive zone.

Additionally, another proposed 5.5 km long Pipeline was to be laid from MGPP to OIL India's Kusijan facility. However, to avoid cutting through the high-density virgin forestland along the proposed route, HOEC chose to lay a 12 km long pipeline along the periphery of the Reserve Forest, where density of forestland is low. This prevented large scale deforestation and reduced the disturbance to wildlife. This decision was taken considering the company's responsibility & principles towards environmental protection.

Furthermore, the company does not carry out flaring activity, nor does it generate any power or noise at the GGS near the wildlife sanctuary.

Cambay

Cambay is HOEC's Oldest operating block having 3 marginal Fields, namely – Asjol, North Balol and Palej, which together currently produce around 150 boepd.

Asjol

HOEC has a 50% Participating Interest in this Field. A Drilling Campaign for the blocks has been planned, with a revised Field Development Plan (FDP) for Asjol having already been submitted.

- Revised Field Development Plan approved and Production Sharing Contract (PSC) extended up to 2030

Palej

HOEC has a 35% Participating Interest in the Palej Field. An additional 97.15 sq. km of R2 area has been granted to the JV, and acquisition of 3D seismic data followed by the subsequent drilling of 2 wells has been committed to.

- The PSC for the same is expected to be executed at the earliest

North Balol

The North Balol block is a gas field which is located 16km west of Mehsana town, covering an area of about 27.3 Sq.km. HOEC has a 25% Participating Interest in this Field.

- Revised Field Development Plan is undergoing the required approval process
- Flowlines spanning 17 kms have been laid
- Since 2005, a GCS has been setup and the plant is functional

Cauvery Offshore - PY-1/PY-3

PY-1

HOEC's PY-1 Field came into existence in 2006. A 56 km long subsea pipeline connects the offshore platform to the processing facility located onshore. A two well re-entry and sidetrack Drilling Campaign was completed in FY18-19. This campaign was designed to rejuvenate the production from the Block with minimal capital expenditure, as the PY-1 plant has ready infrastructure to handle additional production. The campaign has paved the way for future follow-on drilling to explore potential upside from other wells. The site is equipped with efficient and effective water management systems, and also consists of a green belt area to ensure that the biological integrity of the land is maintained as best as possible.

PY-3

The PY-3 Field is under shutdown since July 2011. HOEC has a 21% non-operating stake in PY-3. The PY-1 Gas Field with an offshore platform & onshore processing facility is situated close to the PY-3 Field.

- The PSC has been extended till 2030
- The last production (100%) run resulted in a production of about 3,300 boepd

Bombay High

B-80

The Joint Venture of HOEC (50%) & Adbhoot Estates (50%) won the B-80 Block in the Discovered Small Field (DSF) Round-I held by DGH. The B-80 Block, with the initial data acquired & exploratory activities conducted by ONGC, proved to be a viable Field for production for this Joint Venture & hence a Field Development Plan (FDP) was developed.

Field Development Plan

The FDP consisted of the below highlights:

- Drilling two wells to produce oil and gas
- Processing the produced oil and gas through a Mobile Offshore Production Unit (MOPU)
- The processed oil will be exported through a Floating Storage Unit
- The processed gas will be delivered to Gujarat Gas Market by tapping into an existing gas pipeline system of ONGC

During FY 2019-20, the Board's Risk Management Committee convened to overview the risks involved in the company's operations at B-80 offshore Field viz. operational risks related to:

- Obtainment of Statutory Approvals
- HSE
- Contracts and Procurement
- Logistics
- Subsurface/Geology
- Drilling and Completions
- Rig-aided activities
- Storage & Handling
- Scheduled risks

A few measures to mitigate the above-mentioned risks were identified and discussed. These included:

- Preparation of an HSE Risk Register & Emergency Response Plan
- Formulation of an HSE Reporting Mechanism
- Compilation of a Bridging Manual with mutual aid with ONGC
- Conduction of HSE training & a Medical Fitness Examination for all personnel travelling offshore

Following the committee's recommendations, HOEC safely & successfully drilled two wells - B-80 Block D2 & B-80 Block D1 and conducted flow tests.

Drilling an offshore well during a Pandemic

HOEC was right in the middle of its B-80 Drilling Campaign when the COVID-19 lockdown measures started. Leaving a well half-drilled was as good as no option and so HOEC continued its drilling operations facing the pandemic head-on. Sourcing men & material from across the world and handling local logistics in Mumbai, HOEC ensured minimal rig down-time and successfully completed the Drilling Campaign.

This was possible due to the prompt support received from Directorate General of Hydrocarbons, Ministry of Petroleum & Natural Gas, Government of India, Mumbai Police, Mumbai Port Authorities, State Government of Maharashtra, with excellent co-operation received from all our Oil Field Services Contractors.

B-80 is a pioneer project and is a testament to the success of the Discovered Small Fields (DSF) policy initiative taken by the Government of India, to enhance the domestic oil and gas production.

Roadmap to achieve 'First Oil':

- Any Infrastructural upgrades in the MOPU
- Dry docking and rigorous maintenance of FSO 'Prem Pride'
- Export flowlines for both oil and gas
- Ensuring best practices for HSE & zero COVID positive cases



Figure: Asset Map

Risk Management Committee

HOEC's Risk Management Committee was setup with the objective of assessing operations on a Block-by-Block basis, and to find ways to mitigate or manage any strategic/operational risk element that has the potential to disrupt the normal functioning of a particular asset, or the company as a whole.

THE COMMITTEE COMPRISES OF:



Mr. P.K. Borthakur

Chairman of the Committee/Non-Executive Independent

DIRECTOR



Mr. P. Elango

Managing Director



Mr. R. Jeevanandam

Executive Director
& Chief Financial Officer



Mr. G. Janakiraman

Head – HSE & CSR

While the committee focuses on deliberation of risk ranging from portfolio management and investment to project development, risk management with respect to Health, Safety and Environment also forms an integral part of its oversight.

- Taking severe action against worksite personnel who fail to comply with mandated HSE practices
- Carrying out regular inspections and maintenance of equipment used at operational sites
- Creating an emergency support chart by taking references from major Indian offshore players

HSE Steering and Risk Management (HSESRM) Committee

HOEC has an HSESRM Committee to provide an avenue to review the status of the company's operations, to strengthen the concept of line responsibility towards HSE, and to provide necessary guidelines and corrective measures as deemed fit. All critical issues that need a management directive are discussed during these meetings. However, issue-based decisions are initiated for quicker corrective action, in consultation with all concerned, and decisions need not be pending until these meetings. The committee reviews & evaluates the operational performance, major operational deficiencies, analyses major & high potential accidents/incidents, and initiates corrective actions. It also reviews and commends noteworthy accomplishments. The committee meets once a month to review the status of operations with respect to HSE issues.

The HSESRM Committee comprises of:

- **Managing Director** - *Chairman of the Committee*
- **Asset Managers**
- **Group Head – Technical & Operations**
- **Group Head – Exploration & Development**
- **Head - Contracts & Procurement & Administration**
- **Head - HSE & CSR** - *Member Secretary*



Structure of the HSESRM Committee

The functions of the committee are as follows:

- Review HSE reports from the various assets, review or initiate corrective actions and provide directions for improvement
- Review all incident/near miss reports and identify the level of investigation required
 - Propose an action plan to rectify the lacunae/hazard identified with an estimated closeout time
- Carry out a training needs analysis and identify facilities and resources
- Review all action items raised by HSE inspections & audit (internal/external) reports and monitor the implementation.
- Review effectiveness of emergency drills and exercises held and propose further improvement, if any
- Review and evaluate safety suggestions put forward by staff for the improvement of conditions regarding safety and health. Initiate action and inform the concerned employee of the status
- Review new activities/project proposals, evaluate the potential risks and control measures that may be needed to reduce/control the risks
- Develop an action plan, which shall mention the action(s) to be initiated, the person responsible for closeout and the proposed closeout date, and include them in the minutes of the meeting

The Head of HSE & CSR ensures execution of all action required to be taken with regards to issues discussed in the committee meeting.

During FY 2019-20 the HSESRM Committee convened for a total of 4 times. Some of the key decisions taken during these meetings included:

- Preparation of an operational risk register for the B-80 Field offshore Drilling Campaign
- Establishing a Tier-3 response level in partnership with a Mutual aid entity and the Coast Guard, thereby strengthening HOEC's ability to handle oil spill emergencies
- Categorizing & classifying HSE training modules, to enhance skill of site personnel
- Communication from Top Management to all service providers/working partners regarding the importance of safe working practices, to ensure operational integrity during Drilling Campaigns.

- Diligently review corrective actions of all incidents occurring at site level, by conducting a thorough investigation, to prevent re-occurrence of the same.
- Periodical water sample analysis of surface water from Dirok Field, to ensure its suitability for local community consumption.
- Initiation of cross-asset inspections by individual Installation Managers at all Blocks, to ensure compliance with mandated Health, Safety & Environmental standards.
- Compilation of a video to deliver the Visitor HSE Induction module to all visitors at the PY-1 site.
 - Although this concept was introduced during early 2019, it served as an effective “No-contact” delivery of HSE induction during the COVID-19 pandemic.



| Responsible Growth

HOEC recognizes that the safety of people and preservation of the environment is essential in its efforts to explore for and produce oil and natural gas. The company understands the operational & environmental risks involved in its activities and places utmost importance on the safety of both, its employees and the local communities in which it operates.

A Health, Safety & Environment Management System (HSE – MS) has been developed to achieve the objectives of corporate and regulatory requirements. Environmental Audits are conducted quarterly at all operating assets to reinforce the company's commitment to the same.

HOEC recognizes that contractors working with the company have their own HSE procedures. However, as part of the company's philosophy of responsible operations, HOEC expects all contractors to comply with all local regulatory requirements, as well as with HOEC's own HSE requirements. The company endeavours to produce hydrocarbons in a safe and environmentally responsible manner, and to eventually go beyond minimum compliance, thereby emerging as a leader in the Field of HSE.

Health & Safety

As mentioned before, the Health and Safety records of all employed contractors are evaluated before bringing them on board, and all contractors are expected to adhere to the Health and Safety guidelines prescribed by HOEC, in addition to adherence with local guidelines. Hazardous materials used during operations such as diesel, welding gas, paints etc. are handled in accordance with prescribed safety guidelines.

In terms of training, a mandatory monthly health awareness training program is conducted on site. Safety and environmental awareness training on different topics are also administered internally on site. Standard operating procedures (SOPs) and training programs for accident prevention, personal protective equipment and workplace hazards are also in place. For those involved in offshore operations, Personal Survival Training (PST) is necessary. First-aid training and firefighting training are mandatory for all employees operating at site level. Furthermore, all members of the Oil Spill Response team at HOEC's PY-1 facility have successfully completed Level I of the Oil Spill Response Training program conducted by the Indian Coast Guard. Lost-time injury rate (LTIR) and all nearmiss incidents related to operational activity are tracked on a regular basis.



Figure: Firefighting Training Drill



Figure: HOEC Employees and Contractors Taking a Safety Pledge



Figure: Training on "Rescue Carry" was Conducted by Fire Team at GGS



Figure: Joint Mock Drill on Disaster Management with NDRF and Mutual Aid Partners

Sustained Business During The COVID-19 Scenario

The COVID-19 pandemic has affected all sectors at a global level. The oil and gas industry was severely impacted as the waves of lockdown reduced the demand of oil and gas drastically. This low demand started immediately after a decrease in oil prices due to a supply glut in the market. Clearly, the industry is under tremendous stress and given the situation, redefining operations & business strategy is imperative. HOEC's balanced Portfolio of Assets, Diverse Geographical Footprint and the introduction of COVID-19 Protocols are driving the company's efforts towards building a brighter future.

The COVID-19 Protocol

The HSE team along with various stakeholders, have devised a set of procedures & strategies to ensure minimal to nil exposure to the COVID-19 pandemic. The procedures are a combination of mandated Guidelines & Protocols and Do's & Don'ts that are to be followed stringently. The same has been communicated to all direct and indirect employees of HOEC.

A glimpse of this is shown below:

S. No.	Do's	Don'ts
1.	Self-Examination on health status	Don't consume Self-Medicated drugs in case of any COVID-19 symptoms
2.	Maintain social distance of 2 metres	Don't come in proximity of other people under any circumstance
3.	Staggered seating arrangement in the office and in vehicles	Don't sit next to each other while at office or while travelling in vehicles
4.	Do conduct virtual meetings whenever possible	Don't encourage in-person meetings and if required, restrict attendance to a maximum of 5 people with social distancing
5.	Disinfect handrails, desk, table, chairs, door handles, telephones, photocopy machines, scanners etc. on a daily basis.	Don't Vacuum clean/Dust clean

S. No.	Do's	Don'ts
6.	Do wash your hands frequently with soap & water and sanitize regularly with alcohol-based rubs	Don't shake hands
7.	Cover your nose and mouth with a handkerchief/ tissue while sneezing and coughing	Don't touch your eyes, nose or mouth
8.	Do dispose used tissues in closed bins after use	Don't spit
9.	Do use tissues to hold ladles while serving food items in the canteen	Don't touch ladles with bare hands
10.	Do use staircases whenever possible	Don't use elevators
11.	Do use a face mask/handkerchief	Don't exit premises/rooms without covering your face and hands
12.	Do encourage temperature screening using an IR thermometer	Don't avoid temperature checks

In addition to the above protocols, a separate list of mitigation strategies has been devised and enforced in both, the Corporate Office and HOEC work sites. Below, is a table consolidating these mitigation strategies.

Potential Mitigation Strategies against COVID-19 in Corporate Office & HOEC work sites

What to do if the Corporate Office/HOEC work sites has cases of COVID-19, or if the community is experiencing spread of the virus?	Zero to Minimum i.e, 1 personnel	Minimum to moderate i.e, less than 5 personnel	Substantial i.e, greater than 10 personnel
	Know where to find local information on COVID-19 and local trends of COVID-19 cases	Encourage employees to telework/video conference, particularly individuals at increased risk of exposure to COVID-19	Ensure flexible leave policies for staff

	<p>Know the signs and symptoms of COVID-19 and familiarize yourself with the protocol to be followed if an employee shows symptoms at the work site</p>	<p>Implement social distancing measures- at least keeping a 2 metre distance</p>	<p>Cancel non-essential work travel</p>
	<p>Increase physical space between workers at the work site</p>	<p>Increase physical space between workers at the work site</p>	<p>Cancel work-sponsored conferences, tradeshow, etc.</p>
	<p>Liberal leave and telework/video conference policies</p>	<p>Staggered work schedules and extension of lunch breaks to 2 hours</p>	<p>Find out the number of people that the infected person (in the past seven days) has come in contact with</p>
	<p>Consider 7-day leave policy for people with COVID-19 symptoms</p>	<p>Staggered zig-zag seating arrangement during lunch breaks</p>	<p>Quarantine all personnel who came in contact with the infected person for a period of 14 days</p>
	<p>Consider alternating teams for work schedules</p>	<p>Decrease social contact in the Corporate Office (e.g., limit in person meetings, informal meetings at cafeteria etc.)</p>	<p>Shut down the facility for a minimum period of 5 days and disinfect the entire work site</p>
	<p>Encourage employees to stay at home and notify Corporate Office administrators when sick (Corporate Office/work site should provide non-punitive</p>	<p>Limit large gatherings (e.g., staff meetings, after-work functions)</p>	

	<p>sick leave option to allow staff to stay at home when ill)</p>		
	<p>Encourage personal hygiene among employees (e.g., stay at home when sick, washing hands, respiratory etiquette)</p>	<p>Limit non-essential work travel</p>	
	<p>Clean and disinfect frequently touched surfaces daily</p>	<p>Encourage regular health checks (e.g., temperature & respiratory symptom screening) of employees and visitors entering Corporate Office/work sites (if feasible)</p>	
	<p>Ensure hand hygiene supplies are readily available at Corporate Office/work sites</p>	<p>Find out the number of people that the infected person (in the past seven days) has come in contact with</p>	
	<p>Find out the number of people that the infected person (in the past seven days) has come in contact with</p>	<p>Quarantine all personnel who came in contact with the infected person for a period of 14 days</p>	
	<p>Quarantine all personnel who came in contact with the infected person for a period of 14 days</p>	<p>Shut down the facility for a minimum period of 3 days and disinfect the entire work site</p>	

Shut down the facility for a minimum period of 1 day and disinfect the areas of the work site that the infected person has come in contact with

Resumption of Work During COVID-19 Pandemic

Prior to the resumption of work at the Corporate Office or any HOEC work site, all contact areas were disinfected thoroughly via the various disinfectants prescribed by the Governmental Agencies/SMEs. These areas include the following:

- Entrance Gate of Building, Office etc.
- Meeting Rooms/Conference Halls
- Equipment like Telephones, Photocopy Machines, Scanners etc.
- Verandah and Staircases
- Washrooms, Wash Basins, Water Dispenser etc.
- Walls & other Touch Surfaces

The Standard Operating Procedures outlined directives with respect to disinfection method, type of medium, periodicity, maintenance of log register, etc. Appropriate Personal Protective Equipment (PPE) like visors & masks, and disinfection gadgets like sprayers, brushes etc. were made available to all housekeeping and maintenance personnel.

Various security procedures for employees & third-party contractors were implemented. These included (i) visitation restrictions at the Corporate Office/work sites for personnel residing in COVID-19 containment zones; (ii) prior intimation to the respective Installation Managers & HSE teams at work sites by vendors/suppliers visiting the site; (iii) mandatory installation of AAROGYA SETU Application in all employee/contractor smartphones before entering the Corporate Office/work sites; (iv) entry restrictions for personnel beyond the age of 65 years; (v) compulsory screening of anyone irrespective of cadre/status entering through the gate with a thermal scanner/thermometer; (vi) mandated sanitization and use of PPE, such as masks to enable entry into the Corporate Office/work site etc.

Vehicle Management Policy

Monthly inspection of all company vehicles is carried out by the HSE Engineers at site. Fitness Certificates are issued to all company vehicles upon inspection by third-party inspectors, confirming their safety for daily operations.

These vehicles that use petrol or diesel are periodically assessed, and maintenance is carried out to minimize smoke in the exhaust. The vehicle maintenance area is identified to ensure that the soil is not contaminated by accidental spillage of oil. HOEC's company vehicles have a GPS device installed. The device allows the centralized HSE team at HOEC's Corporate Office to monitor all vehicles in real time. The device can track metrics like distance travelled (Figure 1) and vehicular speed (Figure 2) at different times. Each vehicle's speed is closely monitored to avoid any violations. In case of any speed limit violation, the HSE Managers conduct a briefing with the concerned driver, and also advise them on defensive driving techniques. The HSE team also awards drivers for following safe driving practices on a quarterly basis.

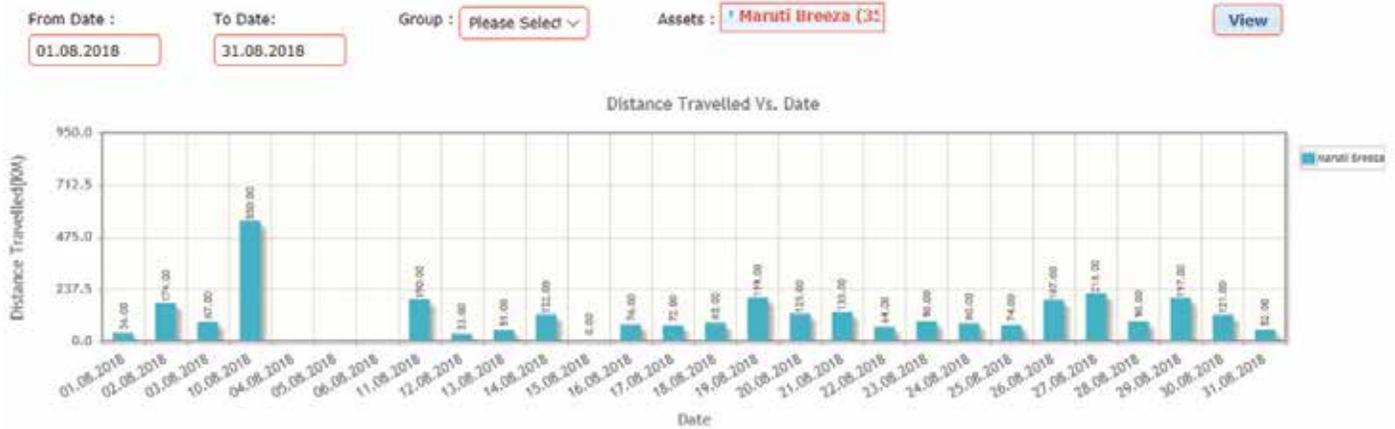


Figure 1: Graphical Representation of the Total Distance Travelled by a Vehicle on a Given Day



Figure 2: Graphical Representation of the Different Speeds at which Different Vehicles Travelled on a Given Day

I Drilling Practices

Flaring activity conducted during well testing is carried out within enclosures lined with asbestos sheets. Asbestos, which is both heat resistant and fire resistant, along with periodic sprinkling of water, ensures that no radiation from flaring is released into the surrounding atmosphere. All generator sets and noise producing machineries used during drilling are provided with acoustic enclosures to reduce noise pollution. Due to increasing environmental concerns, the use of Oil-Based Mud for High-Pressure, High-Temperature (HPHT) drilling, is either prohibited or restricted. Hence, most of HOEC's Drilling Campaigns are carried out using Water-Based Mud (WBM), as it is a more environment-friendly option. The volume of drilling fluids used is reduced at the design stage by selecting modern drilling engineering technology. The mud is reused after its separation from the cuttings. The mud and drill cuttings are first passed over the shale shaker, which is an inclined vibrating screen that separates cuttings from the drilling fluids. The fluids are then pumped through sand trap(s), hydrocyclones (desander and desilter), and centrifuges before arriving at the mud mixing tanks. The sand trap allows sand size particles from the drilling fluids to settle. The hydrocyclones or cyclone-type centrifugal separators impart a whirling motion to the fluids, which produces sufficient centrifugal force to separate the sand and silt size suspended solids from the fluids. The centrifuge is generally used to recover weighting materials, and to remove drilled solids finer than silt. At the end of the Drilling Campaign, the existing mud plant is used for storage and maintenance of drilling muds, for use in other wells.

Reusing drilling fluids significantly lessens their impact on the environment. The following strategy is followed for the management of drilling fluids:

- a) Low toxicity WBM with LC 50 > 30,000 mg/l is used in the Drilling Campaign.
- b) The drilling fluids are recycled and reused to a maximum extent. Residual WBM may be discharged under controlled conditions into the sea. This is done to comply with MoEF&CC/CPCB regulations related to excess turbidity in the water column. Handling and installation of all heavy equipment on site is carried out as per SOPs and requisite safety standards. A Reverse Osmosis (RO) Plant and Effluent Treatment Plant (ETP) are engaged during the drilling process, to treat any generated effluent, and all treated water is routed back for the preparation of mud. During drilling, casing is installed to prevent any seepage of waste into the subsurface in shallow sections. HOEC ensures the maintenance of the structural integrity of all casing through the following tests:
 - (i) Ultrasonic Test to check the thickness of the casing before it is commissioned;
 - (ii) 'Drifting' to check the ovality and thickness of the casing to avoid any failure in latter period of well life; and
 - (iii) Magnetic Particle Test on the threads and body of tubulars

Oil Spill Management

HOEC is prepared to respond to any oil spill incident that may arise during the course of its operations. The Oil Spill Contingency Plan (OSCP) and preparedness for oil spill response in units handling petroleum products in bulk, is a mandatory requirement as per the IMO Convention of Oil Pollution Preparedness, Response and Co Operation (OPRC) 1990, to which India is also a signatory. In addition, the directives given by Indian Coast Guard as per National Oil Spill Disaster Contingency Plan (NOS-DCP), 2006 make it mandatory for all oil companies, ports and oil handling facilities to have an OSCP. The Ministry of Environment, Forest and Climate Change (MoEF&CC) too, have made having an OSCP a mandatory requirement for environmental clearance of offshore locations, before commencement of operations.

To ensure compliance, HOEC has adopted the following:

All onshore facilities are equipped with Oil Spill Kits and an Oil Spill Containment Boom. Fail close pneumatic actuated ball valves act as shutdown valves in the case of high or low oil levels in the condensate tank. As part of incident management efforts offshore, the supply vessel also consists of an Oil Spill Containment Boom. The OSCP has been devised as per the guidelines on Contingency Planning provided by the NOS-DCP of the Indian Coast Guard, Oil Industry Safety Directorate (OISD), Ministry of Petroleum, International Maritime Organization (IMO), and International Petroleum Industry Environmental Conservation Association (IPIECA). In addition, good practices on Oil Spill Contingency Planning from the European Union Series, and shoreline clean up from the United States Coast Guard (USCG) guidelines have also been adopted. An option for shore clean up and separation, and disposal of oil and debris as per the IMO Manual on Oil Spill Response, Volume 4 are also in place.

All equipment selection is finalized as per the guidelines given in:

- Oil Spill Response in Fast Current by USCG
- Study on latest in Oil & Chemical Spill Technology - The Australian Maritime Safety Authority (AMSA)
- World Catalog of Oil Spill Response Products - 2008/09
- Manual on Oil Pollution, Section-IV - IMO
- Action Plan for Oil Pollution Preparedness & Response by European Maritime Safety Agency (EMSA)

Different scenarios are visualized to enable operating personnel to respond effectively to any accidental oil spill from operational activities. These include removal of floating oil from adjoining sea, preventing spilled oil from reaching the coastline, protecting environmentally sensitive areas and coastline clean up response if the spill reaches ashore.

Prevention of oil spillage is HOEC's first priority. Offshore production and drilling facilities have been designed, installed and are being operated in a way, so as to minimize the possibility of oil spills. Facilities, resources and support provided by third parties are also of paramount importance to meet national and international pollution prevention design and operation standards.

HOEC shares the community's concern for the protection of the natural environment from oil spills. The company is committed to integrating into its operations, ways to identify oil spill risks, prevent oil spills, and to implement appropriate changes in its contingency plan for spill response and cleanup strategies.

To achieve this, HOEC's policy is to:

- Respond immediately to any oil spill incident with the objective of protecting marine & human life and to minimize environmental impacts
- Work and consult with appropriate government bodies and the local community to address any issues relating to oil spills in a timely manner
- Provide adequate training and information to enable employees and contractors to adopt environmentally responsible work practices, and to be aware of their responsibilities in the prevention and cleanup of oil spills
- Develop emergency plans and procedures so that incidents (accidental releases) can be responded to in a timely manner
- Develop and maintain a management system to identify, control & monitor risks, to comply with Statutory Regulations and industry guidelines
- Assess the situation and take timely & appropriate action where third-party interests are involved, such as chartered vessels, drill rigs, nearby production platform, nearby ports etc
- Ascertain that each identified employee is responsible for the implementation of this policy in association with his/her specific duties. This includes both contractors and employees

Effective response to a marine oil spill requires mobilization of resources depending on a number of factors. One of the most critical factors is the time taken to activate the plan and mobilize equipment & resources to the scene of the spill. To ensure efficiency of response, a tiered approach is adopted by HOEC management in line with NOS-DCP and OISD guidelines. This plan takes into account the response time needed to mobilize, transport and deploy increasing amounts of resources to the scene of a spill depending upon its size.



Figure: Oil Spill Containment Exercise

Waste Management

All forms of waste, hazardous or otherwise, that are generated by the company's operating assets are recorded based on type, quantity, method of storage and disposal location. Each container used for the disposal of hazardous and solid wastes on-site is labelled appropriately. An annual Return for the generated waste is filed and submitted by June 30th to the relevant State Pollution Control Board for the preceding period from April to March. An annual Environmental Statement is also submitted to the relevant State Pollution Control Board laying special emphasis on the following: (i) the company's water and raw material consumption; (ii) quantity of pollutants discharged into air and water; (iii) quantity of hazardous wastes generated from drilling activities, pollution control facilities and other sources; (iv) quantity of solid wastes generated from drilling activities and pollution control facilities, as well as quantity recycled/reutilized, sold and disposed; and (v) proposed abatement measures and investment to mitigate and prevent pollution.

The relevant State Pollution Control Board grants the company a three-year authorization for the management & transboundary movement of Hazardous & other wastes. Waste generated during operational activity is handled in the following ways: (i) solid wastes are properly segregated; (ii) organic waste is macerated and disposed as slurry into the sea for easy dilution and dispersion; (iii) paper and plastic wastes are bailed and sent for disposal to waste recyclers; (iv) waste lubricating and hydraulic oil are disposed to authorized waste oil recyclers; (v) materials such as scrap metal and surplus chemicals are sent for recycle or reuse as far as practicable; (vi) all waste containers are sent for disposal to authorized waste dealers; (vii) a waste management plan incorporating regulatory & best practice measures is implemented and the staff responsible for waste disposal are provided training and information to ensure proper disposal of the waste; and (viii) inventory of solid waste generation & type are prepared and disposal facilities are audited for suitability prior to the commissioning of operations.

Hazardous waste generated mostly exists in the form of used oil (categories 5.1 and 5.2) and waste/oil residues. Category 5.1 refers to used or spent oil waste generated when replacing hydraulic or lubricant oil from generators, compressors and other pumps & motors after a certain period of time. Category 5.2 refers to wastes or residues containing oil such as sludge collected during slop oil tank cleaning/produced water treatment package cleaning etc. Non-hazardous wastes include kitchen wastes from the canteen, wood wastes from material packing, plastic wastes from empty barrels, paper wastes in the form of old newspapers and office waste paper, and scrap metals from mechanical waste. The used oil is disposed of in accordance with a hazardous waste manifest, and is sent to an authorized waste collector. While the plastic is sold to local collectors, water is diverted to an on-site Sewage Treatment Plant (STP) to be treated and used for maintenance of the green belt on site. Suitable locations are identified at site location to place designated trashcans for the disposal of biodegradable and non-biodegradable wastes. Large drums are used to dispose of the non-biodegradable wastes from processing activities, which are then emptied out by the municipality. In addition to

the above-mentioned waste management strategies, the company's MGPP in Assam, has an LED Digital Display, which reflects: (i) the quantity and nature of hazardous chemicals being used at the facility; and (ii) the quantity of air emissions, waste water discharge and solid wastes generated during operations. An external agency carries out a thorough cleaning of the facility daily.



Figure: LED Digital Display at MGPP in Assam

A Transport Emergency Card (TREM) is issued to any third-party service provider transporting hazardous/other wastes from any of the company's operating assets. These cards contain information about the waste being transported and include details such as type of waste, physical properties, chemical constituents, exposure hazards and the relevant first aid required. This practice has been implemented to ensure the safety of all HOEC's third-party transporters, should any unforeseeable circumstances arise.

TRANSPORT EMERGENCY (TREM) CARD

[To be carried by the transporter during transportation of hazardous and other wastes, provided by the sender of waste]

1. Characteristics of hazardous and other wastes:

S. No.	Type of waste	Physical properties/	Chemical constituents	Exposure hazards	First Aid requirements

2. Procedure to be followed in case of fire :
3. Procedure to be followed in case of spillage/accident/explosion :
4. For expert services, please contact :
(i) Name and Address :
(ii) Telephone No. :

(Name, contact number and signature of sender)

Date.....

Place.....

Figure: Transport Emergency (TREM) Card

| Incident Management

All incidents that occur on site are reported to the installation manager (IM). The IM is responsible for all incident reporting and management and is duly supported by the Health, Safety and Environment team. Regardless of the magnitude of the incident, a detailed investigation is carried out to assess the cause of the event, as well as to make recommendations to avoid something similar from occurring in the future. All details of the incident & subsequent investigations are recorded in an Incident Management Register.

As a precautionary measure, Risk Identification Cards are available on site. These enable site personnel to report any event or observation that they believe has the potential to cause an undesired incident. If it needs to be addressed immediately, appropriate action is taken to do so, otherwise housekeeping and those in charge of maintenance ensure that all aspects of the facility are functioning as they should.

I Land Management

All land utilized for HOEC's operations is acquired on a long-term lease for permission for the same is obtained from the concerned Landowner or District Administration.

During construction, if the project site is undulated, some leveling is done. The terraced level of the site is fixed effectively to balance "cut and fill" by utilizing earth work in excavation in filling low lying areas. Vegetation on topsoil is removed prior to commencement of bulk earthwork. Construction water is drawn from existing approved vendors in the vicinity. During dry weather conditions, dust may be generated by activities like excavation and transportation. The dust is suppressed by water sprinkling or dust barriers.

HOEC and/or concerned contractors identify site-specific restoration requirements that align with applicable regulatory, landowner, and stakeholder requirements and expectations. The company understands the regulatory requirements from project-specific regulatory registers, EIA-EMP studies, and license/production sharing documents. The company respects the views and concerns of stakeholders (who directly or indirectly depend on land use of a particular area) through the stakeholder engagement process and tries to address them to the best of its ability. The owners of the land, stakeholders, or their legitimate representatives are consulted in the preparation of the site-specific restoration procedure.

All utility services such as electricity, gas and water are shut off during demolition work. Tanks, vessels and pipe work are completely isolated from inlet, outlet and overflow points. All equipment, machines and infrastructure (e.g. storage tanks, flow lines and pipelines) are purged and/or flushed as appropriate, to remove hazardous materials such as hydrocarbons and chemicals. The recovered hazardous materials are disposed to an Effluent Treatment Plant (ETP) facility that meets the Pollution Control Board guidelines. Drilling waste pits (viz. reserve pits, soak pits) are closed as soon as reasonably possible following the completion of activities. Reserve pits are maintained after the drilling waste is removed, and the pit is dry. The liner is left in place.

At least 1 metre of crown material is left over the filled pit. The reserve pits are adequately barricaded to prevent entrapment and mortality of animals. Septic tanks and soak pits are restored by dismantling in place, and backfilling with at least 1 metre of soil cover after they have dried, or once the wastewater has been removed and disposed of.

Non-hazardous wastes from the site are moved to HOEC's waste storage area. Records of all waste transfer/disposal are maintained. All equipment and machines that are engaged during the drilling campaign, are dismantled and removed in the following ways:

- The reuse of salvage materials is considered prior to start of restoration
- All RCC and PCC structures are dismantled. Blasting was not permitted in any case or as per environment management plan
- Broken materials such as concrete debris, bricks etc. are disposed of to a safe place, where there is no potential damage to the environment, property of HOEC or any other third-party property. They can also be reused, if required. The debris disposal site is pre-determined and approval for the same is obtained from HOEC by the contractors to avoid any concerns with regards to disposal at unauthorized/- objectionable sites
- Storage of dismantled materials is not permitted at HOEC's site premises. Contractors are asked to remove them from site immediately after the dismantling process is complete

Upon completion of decommissioning and demobilization, the site is thoroughly cleaned by removal of all materials that are not required for restoration. No construction debris, industrial or domestic waste is left behind. All the waste removed from site is managed in a manner to ensure no environmental or social impacts in future.

- Care is also taken to avoid excessive cutting & removal of existing soil of the land while removal/scraping of the WBM/Gravel/Mooram etc
- Stone masonry & brick masonry are removed safely from all the existing structures on site and disposed of to a safe place in a manner that is acceptable to HOEC. They can also be reused for any other work
- After removing/scraping all the construction materials, the leftover materials mixed with the existing soil, are carefully removed with minimum quantity of soil from the completed site and the area is leveled & graded appropriately
- Once the entire area is adequately graded/leveled as per HOEC's satisfaction, good quality topsoil (from the same area, which is stored separately before the initiation of the work) is kept at the top surface of the land by blending into the existing soil

- Borrow material required for restoration is sourced from authorized sources
- The site area is graded and leveled to the original contour level as best as possible. The hard surface along the access road is considered and topsoil is spread to its original location. The erosional potential of undulating or sloping lands due to water and wind, is considered during topsoil replacement

After the completion of drilling activities, all drill sites are restored back to near original condition. Leveling and compaction are done with the help of graders and mechanical rollers, while earth, fill material, and rubble are used for land filling and site restoration. The drainage of the restored site is consistent with the original patterns, direction and capacity established during baseline studies and is compatible with the surrounding landscape.

| Air Management

During construction, specific attention is paid to:

- (i) appropriate management of power generation source to achieve fuel efficiency and therefore reduce emissions;
- (ii) use of low sulphur diesel oil (0.25% sulphur content);
- (iii) appropriate storage and handling procedures to reduce fugitive emissions of VOC's from diesel fuel; and
- (iv) installation of closed circuit type refrigeration and air conditioning systems to avoid the loss of ozone depleting material.

During the operational phase, the following measures are adopted:

- (i) appropriate maintenance and management of solar power generation sources;
- (ii) use of low sulphur diesel oil (0.25% sulphur content) in DG sets for emergency operations;
- (iii) minimization of fugitive emissions from storage and handling operations; and
- (iv) periodic verification and audits are carried out for leakages along with status of seals and packing at all joints.

The potential for any direct impact on ambient air quality on site can be mainly attributed to the Gas Generator stack and the Hot Oil stack. The State Pollution Control Board monitors ambient air quality on site. Additionally, an external laboratory is tasked with assessing ambient air quality levels at site on a monthly basis. The laboratory compiles a report of its findings and sends it to the chemist on site. Indirect impact on ambient air quality can be attributed to flaring activities on site. Adequate DG stack height is accounted for to enable effective dispersion of air pollutants, and to meet the minimum stack height and emission concentrations criteria set by the Central Pollution Control Board (CPCB).

Gas Flaring

Flaring of natural gas releases carbon dioxide and thus contributes to climate change. Other harmful emissions include sulfur oxides and nitrogen oxides, which combine with moisture in the atmosphere to form acid rain that acidifies lakes, streams, and damages vegetation. Furthermore, pollutants such as particulate matter, hydrocarbons and ash can deplete soil nutrients through acidification, and harm agriculture.

The health implications of flaring can be significant too. Exposure to the emissions of flaring can cause cancer, lung damage and skin problems.

In order to mitigate the undesirable impacts of flaring, HOEC has made a conscious effort to design its flaring systems as per requisite environmental standards. All processing facilities are equipped with flare systems for the safe and clean disposal of hydrocarbon vapour during operations. Both, a High Pressure (HP) and Low Pressure (LP) flare system are provided for the disposal of high-pressure and low-pressure sources of hydrocarbon. Equipment with a design pressure of 75 psig or greater is connected to the HP flare system; the remaining sources relieve into the low-pressure header.

The high-pressure sources could include:

- Relief valves from high-pressure equipment such as Slug catcher, Separators, Sales gas to a power plant, and 1st Stage Separator
- Automated blow down valves from high-pressure systems
- Manual vents from high-pressure equipment

The only sources of low-pressure release could be a Second Stage Separator and the Produced Water Degasser. The HP Flare System consists of a flare header and several branch lines. The header slopes downwards and feeds into the HP Flare Knockout Drum where relief liquids are removed. The HP Flare Drum Pumps direct hydrocarbon and aqueous liquid separated within the drum to the Slop Oil Tank. The relief vapour then continues to the Flare Package where it is combusted in an elevated high-pressure flare tip. The tip is mounted directly on the stack, and high-pressure hydrocarbon releases are combusted at this point. The tip arrangement also includes a separate connection for the LP header. The lowpressure relief vapour is not combusted within the HP tip, rather directed into the flare pilot. The LP Flare System consists of a flare header, which slopes downwards and into the LP Flare Knockout Drum. Liquids separated in the LP drum are directed to the Slop Oil Tank by the LP Flare Drum Pumps. The relief vapour then continues to the Flare Package where it is combusted. The elevated Flare Package contains both a high-pressure (HP) and low-pressure (LP) tip for the disposal of

hydrocarbon releases. The tips are mounted on a 30 metre high self-supporting stack, and the package is designed for pressure assisted smokeless operation.



Figure: Flare Tower at PY-1

Another system called the ground flare (300-X-003) is a sonic, natural draft, horizontal flare system fitted with six burners, four pilots, one ignition control panel and one flare header. The flare and piping to the flare are sized for 35 mmscfd. A fence is provided around the ground flare to guarantee that the flames are concealed, thereby preventing exposure to the surrounding environment.



Figure: Flare Enclosure at Modular Gas Processing Plant in Assam

Liquid Waste Management

Offshore

Wastewater generated mainly contains domestic sewage and wash downs if any. The following measures are taken to ensure that no waste is discharged directly into the sea: (i) the Barge is equipped with suitable containment and treatment systems; (ii) deck washings are routed through an oil/water separator before being discharged into the sea; (iii) good housekeeping practices are adopted onboard the Barge; (iv) chemicals are stored in dedicated storage areas with containment provisions; (v) any oily waste or chemical waste generated, is brought back to the shore for proper disposal; and (vi) the sanitary effluents onboard are treated in a suitably designed Sewage Treatment Plant (STP) before being discharged into the sea.



Figure: PY-1 Offshore Facility & Rig during Drilling Operation

Onshore

The following measures are taken to ensure minimum contamination of water: (i) the processing facilities are equipped with suitable containment and treatment systems; (ii) good housekeeping practices are adopted at site; (iii) chemicals are stored in dedicated storage areas with containment provisions; (iv) any oily waste or chemical waste generated, is disposed of as per norms; (v) sanitary effluents at site are treated in a suitably designed Sewage Treatment Plant (STP) before being discharged into the sea; (vi) appropriate segregation and collection systems are in place for various effluents depending on their individual stream characteristics; and

(vii) the process area is paved to avoid the contamination of soil/subsoil/ground water in case of accidental spills/leakage of hydrocarbon liquids.

During routine operations, no liquid waste generation occurs. However, there is a provision made for rain and storm water, as the water coming from the equipment may contain oil or other contaminants. Water production during the gas processing cycle can only be attributed to the slug catcher area. The degasser filters out the dissolved gases and minor traces of oil in the water and diverts the filtered water to the produced water holding pond on site. A deoiling hydrocyclone is utilized to separate oil from the produced water by means of centrifugal force. Water in the pond is periodically aerated and when the pond is sufficiently full, the water is sent back into the sea in the form of marine outfall. Marine outfall is tested periodically by an external laboratory, to ensure that it is compliant with relevant thresholds.



Figure: Marine Outfall Point at PY-1

I Noise Management

To minimize ambient noise levels the following steps are taken: (i) generators are provided with acoustic enclosures; (ii) the exhausts are provided with silencers; (iii) operators/personnel working near noise sources are provided with earmuffs and earplugs and their use is strongly enforced; (iv) insulating caps and aids are provided at the exit of the noise source on the machinery; (v) damping materials such as thin rubber/lead sheet are used for wrapping the work places like compressors, generators; (vi) shock absorbing techniques are adopted to reduce impact; (vii) all openings like covers and partitions are acoustically sealed; and (viii) inlet and outlet mufflers are provided.

Apart from the measures stated above, during routine operations, operators/personnel working near noise sources are mandated to use earmuffs and earplugs.

The main sources of noise on site would be the Instrument Compressor House and the Gas Generator Set. A third-party agency approved by the State Pollution Control Board is also tasked with measuring and monitoring noise levels on site on a monthly basis.

Pipeline Management

During installation of pipelines connecting drill sites with processing facilities, the following precautions and protection measures are taken:

Offshore

- (i) Care is taken to cause minimum damage to benthic fauna of water bodies during pipeline installation;
- (ii) Minimal seabed disturbances are ensured;
- (iii) Precautions are taken to prevent the formation of spoil banks as a result of pipeline laying to ensure minimum alteration of sedimentary patterns;
- (iv) Minimal disturbance of the shoreline and foreshore dunes; any disturbed areas are restored to their previous alignment and level;
- (v) Any existing pipelines in the layout route are protected;
- (vi) Access ways are reinstated to pre-development condition, particularly where the alignment crosses watercourses;
- (vii) Pipelines are laid below ground level to a sufficient depth where the line crosses watercourses to ensure that the integrity of the line is protected;
- (viii) Existing surface flow conditions are reinstated wherever diversion of the flow of streams, ditches, culverts etc. are required in the course of pipeline construction;
- (ix) All areas affected by the establishment of the line, both within and adjacent to the layout are restored;
- (x) All excavated material is back filled and compacted prior to top soiling using the material originally excavated from that portion of the trench as far as practicable;
- (xi) Erosion is adequately controlled;
- (xii) Discarded or surplus materials, litter and other debris from the activity and other working areas are removed and they are left in a neat, clean condition;
- (xiii) Adequate provisions for infrastructure facilities are provided to the labourers during the construction period in order to avoid damage to the environment;
- (xiv) Colonies for the labourers are located away from the Coastal Regulation Zone (CRZ) area;

- (xv) All construction areas have restricted access, taking into consideration safety, environment and construction objectives;
- (xvi) Controls are put in place to ensure that the construction work has minimal impact on the local population;
- (xvii) An appropriate standard of housekeeping is maintained at the construction camp to ensure that waste is stored and disposed of in a manner to prevent vermin, flies etc.;
- (xviii) All rubbish and waste material are removed upon the completion of construction;
- (xix) Safe drinking water is supplied to the labourers' colony;
- (xx) Safety programs and safety audits are regularly implemented;
- (xxi) For Barge/vessel movement, relevant internationally recognized safety standards are applied.

Onshore

- (i) All the debris resulting from onshore installation is retrieved;
- (ii) Precautions are taken to prevent the formation of spoil banks as a result of pipeline laying to ensure minimum alteration of sedimentary patterns;
- (iii) Since the submerged pipeline runs onshore, the pipeline route is flagged to avoid damage from digging operations;
- (iv) Any existing pipelines in the layout route are protected;
- (v) Minimal vegetation clearance and stockpile vegetation for onshore pipeline installation;
- (vi) Access ways are reinstated to pre-development condition, particularly where the alignment crosses roads;
- (vii) Pipelines are laid below ground level to a sufficient depth where the line crosses dunes, roads or access tracks to ensure that the integrity of the line is protected;
- (viii) All areas affected by the establishment of the line, both within and adjacent to the layout are restored;
- (ix) All excavated material is back filled and compacted prior to top soiling using the material originally excavated from that portion of the trench as far as practicable;

(x) Restoration of land surface and landform in a way that is consistent with the condition and contours prior to the commencement of construction;

(xi) Erosion is adequately controlled;

(xii) Discarded or Surplus materials, litter and other debris from the activity and other working areas are removed and they are left in a neat, clean condition;

(xiii) Adequate provisions for infrastructure facilities are provided to the labourers during the construction period in order to avoid damage to the environment;

(xiv) All construction areas have restricted access, taking into consideration safety, environment and construction objectives;

(xv) Controls are put in place to ensure that the construction work has minimal impact on the local population;

(xvi) An appropriate standard of housekeeping is maintained at the construction camp to ensure that waste is stored and disposed of in a manner to prevent vermin, flies etc.;

(xvii) All rubbish and waste material are removed upon the completion of construction;

(xviii) Safe drinking water is supplied to the labourers' colony;

(xix) Safety programs and safety audits are regularly implemented;

(xx) A dedicated team of personnel regularly patrols the pipeline with GPS trackers to ensure that no part of it is exposed and that its physical integrity is maintained, so as to prevent any leakages.

I Preventive Maintenance

Preventive maintenance onshore is carried out by site personnel, as well as external contractors, depending on the nature of the work. As is the case with all other work on site, carrying out maintenance work requires one to have a permit. The facilities are equipped with a Safety Integrity Logic – Level III (SIL) System. All plant parameters on site are controlled through a Distributed Control System (DCS). In case of any deviation from the requisite parameters, the DCS shuts down all systems.

The Emergency Shutdown System (ESD) operates on three different levels (Levels I, II and III), each of which initiate a unique shutdown sequence, to ensure maximum safety. The ESD also includes an integrated fire and gas reduction system comprising of flame detectors, point source gas detectors, open path gas detectors, manual call points, and fusible loop plugs. Additionally, all members of the operations team carry multifunctional portable gas detectors to assess upper and lower explosive limits (UEL and LEL) at all times. The ESD undergoes scheduled preventive maintenance, as well as an integrity test every 6 months, so as to remain optimally functional at all times. Individual preventive maintenance reports are generated for each component of the ESD.

The offshore facility is equipped with a Supervisory Control and Data Acquisition (SCADA) System. All offshore operations are controlled through a Programmable Logic Controller (PLC). The facility has gas detectors installed at more than 20 locations, and also comprises of pressure switches and level switches. In case of an emergency, a remote shutdown of the facility can be carried out from onshore.

Corporate Social Responsibility

HOEC is committed to operate and grow its business in a socially and environmentally responsible way with a vision to transform the quality of life in all its operating areas. We strive to demonstrate the highest standards of corporate behaviour towards all stakeholders and the local communities in which we operate. We believe that only through responsible actions, can we earn our License to Operate from our host communities.

Corporate Social Responsibility (CSR) is an integral part of the company's business operations and resource development endeavours, and the company's mission is aligned with Schedule VII of the Companies Act, 2013. HOEC's CSR programmes focus on the following seven broad themes with the objective to improve overall socio-economic indicators in the company's areas of operation:

- **Promotion of Education, Special Education and Vocational Training**
- **Gender Equality - Women Empowerment & Senior Citizens**
- **Healthcare**
- **Ensuring Environmental Sustainability, Ecological Balance, Wildlife Conservation**
- **Rural sports, Paralympic and Olympic sports**
- **Disaster Relief Work etc.**
- **Rural Development Projects**

Infrastructure/Rural Development

Dirok

HOEC strives to improve lives of the local communities through their CSR initiatives, by identifying areas that need intervention. Various activities have been taken up towards developing the basic infrastructure in and around Augbandha Panchayat. These include repairing existing roads, development of new Water Bound Macadam (WBM) & Paver Cement Block roads, improving sanitation facilities by constructing toilets and other allied activities. As of March 2020, the company has installed about 105 solar streetlamps within its operating area, receiving positive response from the local community that often faces several power cuts. The company has also taken up initiatives such as restoration of water bodies and cleaning of canals in the rural areas.



Figure: Solar Streetlamps Installed by HOEC in Augbandha Village

Projects related to sanitation and hygiene constitute a significant amount of our work and investment. HOEC believes that sanitation is a foundational issue that impacts all other aspects of well-being. During this past financial year, HOEC constructed 4 sanitation blocks in Augbandha Village.



Figure: Construction of New Public Toilet in Augbandha Village



Figure: Construction of New WBM Road in Augbandha Village



Figure: Construction of New Cement Block Road in Augbandha Village

Education

Dirok

School upgradation and infrastructure development has been undertaken in more than 2 schools. An English Learning Programme has also been introduced to the students of four primary schools. The renovated existing facility at the Augbandha Government Primary School is being used as a mealtime space, an audience hall, a rest & recreation centre and occasionally to conduct classes outside the routine classrooms.

HOEC also refurbished two Anganwadis in Augbandha Village and provided the pupils with playground equipment. Additionally, the top 5 students from the 10th, 11th and 12th grades of the village school located in proximity to the area of operations, are felicitated with cash prizes.



Before

Renovation of Existing School Facility in Augbandha



After



Figure: Setting Up of Playground Equipment in Anganwadis

PY-1

Renovation of a Government Middle School in Veppancherry resulted in a long awaited makeover for the students and staff.

Health

Dirok

As we are all aware, regular exercise and physical activity result in strong muscles and bones. It also improves respiratory, cardiovascular and overall health. Considering the benefits of exercise and prevalent weather conditions in Assam, HOEC set up an Open-Air Gym in the town of Margherita, to promote physical fitness amongst the population.



Figure: Setting Up of Open-Air Gym in Margherita

HOEC also installed a modern 250 LPH Capacity Reverse Osmosis Drinking Water Plant at Margherita Civil Hospital. The objective of this initiative is to provide clean drinking water to the out-patients and in-patients of the Margherita Civil Hospital.

Disaster Relief Work

During the COVID-19 Pandemic, HOEC distributed provisions like rice, dal, oil etc. to about 2000 families living in close proximity to the company's areas of operation.

During FY 2019-20, the company contributed about Rs.15,00,000 towards Assam Chief Minister's Relief Fund to help the people who were affected by floods in July/August 2019.



Figure: HOEC's Disaster Relief Efforts

I Conclusion

HOEC understands the growing concern for environmental quality and its subsequent impact on life. The company continues to remain committed to adhering to the highest environmental standards and enhancing the socio-economic and environmental quality of the local communities where it operates. HOEC's long-term vision includes using research and technology to move towards being emission-free and leaving a positive ecological footprint. The company recognizes that constant improvement is vital to achieving this and will continue to do so with utmost dedication. The company will focus on: (i) continuously developing a comprehensive Environmental Management System (EMS) to minimize waste and emission generation, and promote operational efficiency; and (ii) conducting extensive research on the possibilities of utilizing the by-products from its operations, in order to prevent their release into the surrounding environment. Through its efforts, HOEC aims to lead by example, and hopes to create impact that other oil and gas companies would be proud to emulate.

I end with the following insights as summarized by Professor D. Balasubramanian:

“Temperature rise and climate change affect not just some countries but the entire globe, on which all species live – humans, animals, plants, fish, microbes. And if it is uncontrolled, disaster looms for all life across the globe.”

HOEC believes “All Lives Have Equal Value”, and is determined to contribute to sustainability. This report is one small step in that direction.

ANNEXURES



Hindustan Oil Exploration Company Limited

ENVIRONMENTAL POLICY

Oil and gas operations involve hazardous conditions. HOEC recognizes this and is committed to conduct its business operations on the core principle of “Sustainability”.

HOEC’s Environmental Vision is to emerge as a role model for sustainable business practices in oil and gas sector. In order to achieve this, the company is committed to :

- **Conducting its operations responsibly by complying with applicable laws, regulations and policies. HOEC will pro-actively engage with regulators, industry peers and independent auditors to identify deficiencies in our operations and induct best practices to ensure continuous improvement.**
- **Developing a comprehensive Environmental Management System (EMS) to minimize waste and emission generation, thereby promoting operational efficiency.**
- **Performing comprehensive internal site audits before and during major operational activities, such as drilling and production to ensure the adoption of adequate measures to protect surrounding air, water, land and bio-diversity.**
- **Accounting for greenhouse gas emissions appropriately and adopting measures to reduce the volume emitted.**
- **Integrating relevant sustainability practices into the design and construction of new facilities.**
- **Devising a suitable water management system that would allow the company to re-cycle and re-use non-potable water, rather than disturbing freshwater sources in and around the communities, where it operates.**
- **Establishing a plastic management system to track the amount of plastic and throughout the organization and to develop strategies to reduce the same.**
- **Assessing and monitoring the sustainability record of all service providers and contractors to ensure that their goals align with those of HOEC.**
- **Enhancing the socio-economic and environmental quality of the local communities, where the company operates.**
- **Dedicating resources towards the research and implementation of new technologies and methodologies that would help the company in meeting its sustainability goals.**

Under the oversight of HOEC’s Board, the Management takes full responsibility to implement this Environmental Policy and expect that all the employees and service contractor’s personnel to do the same and aid HOEC to emerge as India’s leading independent oil and gas company in environmental stewardship.

Chennai, March 5, 2019

P.Elango
Managing Director

ANNEXURES



Hindustan Oil Exploration Company Limited

HEALTH AND SAFETY POLICY

The oil and gas sector is an important global industry and its operations can have both positive and negative impact. HOEC is committed to enhance the positive impact, avoid and mitigate negative impact by carefully planning and safely implementing each of its operations.

HOEC's Health and Safety Policy is anchored on the core principle that "All Lives Have Equal Value" and "Nothing is More Important than Safe Operations". HOEC's Board and the Management understand the need for sustainable development and are committed to achieve this goal, by laying strict emphasis on compliance with all legislations and statutory requirements and to adopt global best practices. This includes the welfare, health and safety of employees, contractors and the local communities, where the company operates, as well as the safety of all its operational machinery and equipment.

HOEC aims to create a healthy and safe work place for all relevant stakeholders by :

- Performing comprehensive internal site audits before and during major operational activities, such as drilling, development and production.
- Assessing and monitoring the health and safety track record and performance of all service providers and contractors, both before and after the award of contracts to achieve the common objective of safe operations.
- Holding all operating personnel accountable to maintain a healthy and safe working environment on site, by empowering them to stop an unsafe act irrespective of its financial impact.
- Utilising the Health, Safety and Environment (HSE) Department as a store house of expertise, which passes on all relevant knowledge to Operating Personnel and Managers stationed at various sites.
- Reviewing regularly all Standard Operating Procedures (SOPs) and developing new ones that are in line with those implemented across the industry.
- Hosting extensive training programmes periodically to familiarizes all new and existing recruits with SOPs.
- Continuously engaging with vendors and contractors as partners to achieve the common goal of safe operations.
- Engaging all operating personnel in monthly mock safety drills to ensure that all personnel remain aware and vigilant carrying-out operational activity.
- Carrying out an extensive review of all its facilities to ensure that all machinery and equipment are functioning in accordance with industry standards.
- Regularly monitoring the Emergency Response Plans in place at all sites, so as to prevent escalation and to enable the mitigation of impact on all personnel and assets in the case of an unlikely event.
- The HSE Department is tasked with conducting in-depth research to stay informed on new drills, safety methods and techniques. These include, but are not restricted to chemical exposure, chemical storage, chemical handling, equipment / machine hazards, safe practices in confined spaces / excavations, fall protection, fire protection, electrical work, hot work, welding, flame cutting operations, personal protective equipment, power sources and working in the heat or long shifts.
- HOEC Board has constituted a Risk Management Committee and provide oversight to ensure full implementation of this Health and Safety Policy.
- It is the responsibility of all employees and service contractors personnel to strictly adhere to the Health and Safety Policy of the Company and follow the Standard Operating Procedures (SOPs). HOEC has a "No Excuse Policy", when it involves safety and integrity.

Chennai, March 5, 2019

P. Elango
Managing Director

