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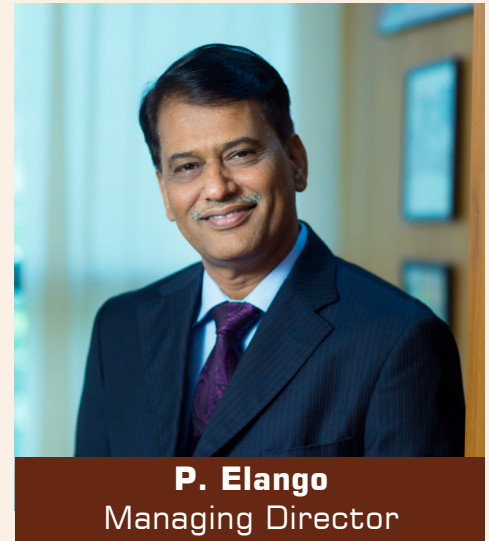
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## A MESSAGE FROM THE MANAGING DIRECTOR

It gives me an immense sense of satisfaction to present HOEC's inaugural Sustainability Report to you! 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 & Gas Exploration & Production (E&P) activities, in line with the commitments undertaken with the Government of India.

Stringent environmental compliance, comprehensive safety practices, and positive socio economic impact on local communities, are a 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.



**P. Elango**  
Managing Director

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

At the 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 woman 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 business decisions, and to champion the company's ambition to conduct business in that manner. We are committed to continuously enhancing our business practices to effect positive change, and to enable HOEC to stand at the forefront of the Oil & Gas companies operating in India.

Before I conclude, I wish to acknowledge the contributions made by Pranay (Trainee - Strategy) and Janakiraman (Head – HSE & CSR) in the preparation of this inaugural Sustainability Report.

Sincerely,



**P. Elango**  
Managing Director

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## Reporting Guidelines

This report is a culmination of information gathered from various site assessments, the systems and practices followed at site level, and internal company documents. The information regarding the impacts of flaring, included in the 'Gas Flaring' section of this report has been extracted from [energyeducation.ca](http://energyeducation.ca), an energy education website associated with the University of Calgary.

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## 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 realizes 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 as a result of 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 meets desired environmental standards.
- ▶ Third-party agencies are tasked with monitoring emissions at site level periodically.
- ▶ All Health, Safety, Environment and related issues are incorporated and addressed during hook-up & commissioning of new installations, routine productions and regular logistical facilities for 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.

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## Brief Overview of HOEC's Asset Portfolio

HOEC currently operates in 9 Blocks across India, and has 5 producing fields with a gross average production of 9,171 BOEPD and a net average production of 4,107 BOEPD. This includes 6 oil-producing Blocks and 3 gas-producing Blocks spanning the Assam, Cauvery and Cambay 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
- Cambay

- **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 3 Blocks (Dirok, Kherem and Kharsang) within 50 km from each other in the North-East. In the 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. The company has now firmly established its position as the largest private producer of Oil & 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. Further more, the company does not carry out flaring activity, nor does it generate any power at the GGS near the wildlife sanctuary.

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## **Cambay:**

There are 3 marginal fields at Cambay namely – Asjol, North Balol and CB-ON-7, which together currently produce around 150 boepd. A drilling campaign for the blocks has been planned, with a revised Field Development Plan (FDP) for Asjol having already been submitted. A revised FDP for North Balol is being devised at the moment. With regards to CB-ON-7, 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. Execution of the PSC is expected to take place soon.

## **Cauvery Offshore - PY-1/PY-3:**

HOEC's PY-1 field came into existence in 2006. A 56 km long sub-sea pipeline connects the offshore platform to the processing facility located onshore. A two well re-entry and sidetrack drilling campaign has recently concluded. 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.

The PY-3 field was shut down in July 2011, when it was producing 3000+ bopd without any subsurface issues. However, now, as part of a new strategy, PY-3 operations will be revived with ONGC assuming operatorship of the field under the PSC/JOA. The field will be operated under joint operatorship model with HOEC assuming an appropriate role. HOEC currently operates its PY-1 gas field with an offshore platform and onshore processing facilities, both of which are located close to the PY-3 field. Considering the proximity between PY-1 and PY-3, integration of the two facilities through a 6 km long offshore pipeline is the most feasible and cost-effective option to revive production from PY-3. To accomplish this, applications for a revised FDP and PSC extension have been filed, and are currently under review by DGH (Directorate General of Hydrocarbons).

## **Bombay High – B-80:**

After securing the discovered Block MB/OSDSF/B80/2016 in Discovered Small Field (DSF) Bid Round I, HOEC was the first operator to obtain FDP approval. The firm is currently progressing development on a fast-track basis targeting "First Oil" by Q1 of FY 2020-21. The phase – 1 development of B-80 envisages drilling of two sub-sea wells, installing a Mobile Offshore Processing Unit (MOPU) and hooking up of the wells through flow lines. The oil & gas is to be evacuated through existing pipelines of ONGC. Gross production of 5,000 barrels of oil and 15 mmscfd of natural gas is targeted from B-80. The company is currently in the process of obtaining the necessary environmental approvals, in order to operate without causing any adverse impact to the surrounding marine life.



# OUR ASSET PORTFOLIO

Consists of 9 Oil & Gas blocks of Discovered Resources



Asset Map depicting all 9 Operational Blocks – Umatara (K) is currently under development and AA-ONHP-2017/19 (J) is currently being explored

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## Risk Management Committee

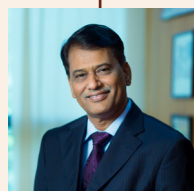
HOEC's Risk Management Committee was set up with the objective of assessing operations on a Block-by-Block basis, and to find ways to mitigate or manage any strategic/operational risk element that has the potential to disrupt the normal functioning of a particular asset, or the company as a whole.

### THE COMMITTEE COMPRISES OF:



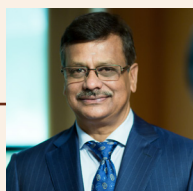
**Mr. P.K. Borthakur**

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.

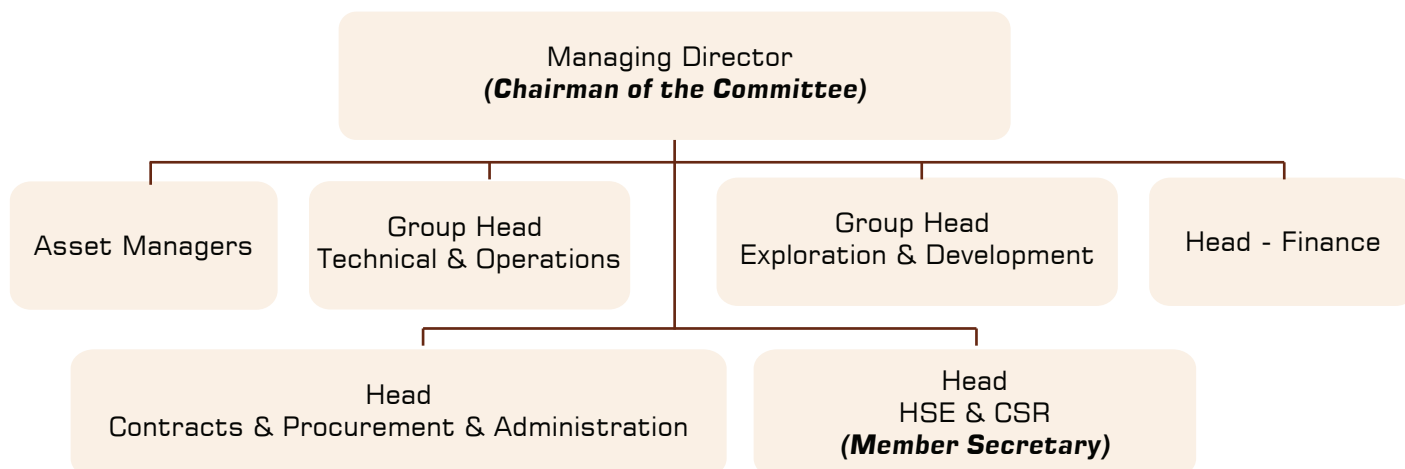
### Some of the key HSE decisions made by the committee this past financial year included:

- ▶ Reclassifying and summarizing the nature of inspections and audits for final reporting at the committee level
- ▶ Analyzing and categorizing the incidents reported to draw a distinction between personnel and property injury, thereby enabling more efficient reporting at the committee level regarding unsafe conditions at operating sites
- ▶ Developing bridge manuals for HOEC based on a study and analysis of the HSE manuals of other vendors.

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## 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.



Structure of the HSESRM Committee

### The HSESRM Committee comprises of:

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

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**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, identify the level of investigation required, action plan proposed to rectify the lacunae/hazard identified and 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, shall be made as part of 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 2018-19 the HSESRM Committee convened for a total of 5 times. Some of the key decisions taken during these meetings included:**

- ▶ Providing competency-based training programs such as HSE Auditing, to all field employees
- ▶ Prioritizing the safe operation of pipelines by:
  - Ensuring zero exposure of the pipeline
  - Conducting a line walk to monitor the underground operations supporting optimal pipeline functioning
- ▶ Administering Basic Offshore Survival Training (BOSIET) to all employees involved in the B-80 drilling campaign, as a preparatory task
- ▶ Identifying and procuring the critical spares required for the seamless operation of both, the company's GGS in Assam and other assets
- ▶ Carrying out a third-party electrical audit at both, the company's GGS in Assam and other assets

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## Responsible Growth

Hindustan Oil Exploration Company 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. There is a growing recognition about the importance of safety and environment in our operations and its impact on society, and hence, a Health, Safety & Environment Management System (HSE – MS) has been developed. The HSE Management System aims to achieve the objectives of corporate and regulatory requirements. 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 HSE requirements. The company endeavors 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.

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## 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 construction 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 near-miss incidents related to operational activity are tracked on a regular basis.



Firefighting Training Drill





HOEC Employees and Contractors taking a Safety Pledge



# Vehicular Maintenance and Driving Practices

A monthly inspection of all vehicles is carried out by the HSE Engineers at site. All transport vehicles using petrol or diesel are properly maintained 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.

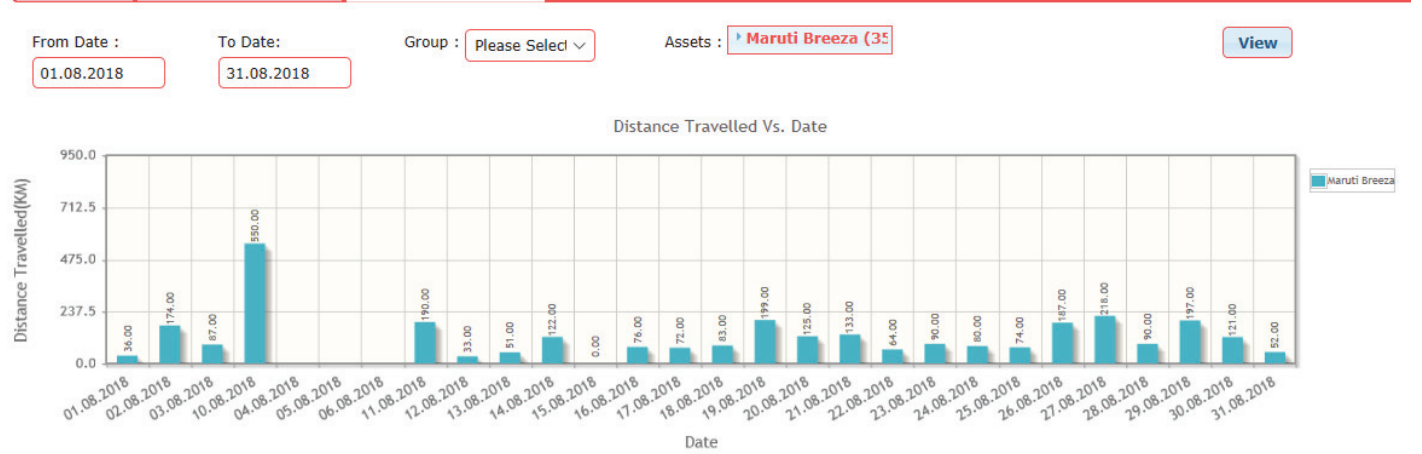


Figure 1. Graphical representation of the total distance travelled by a vehicle on a given day

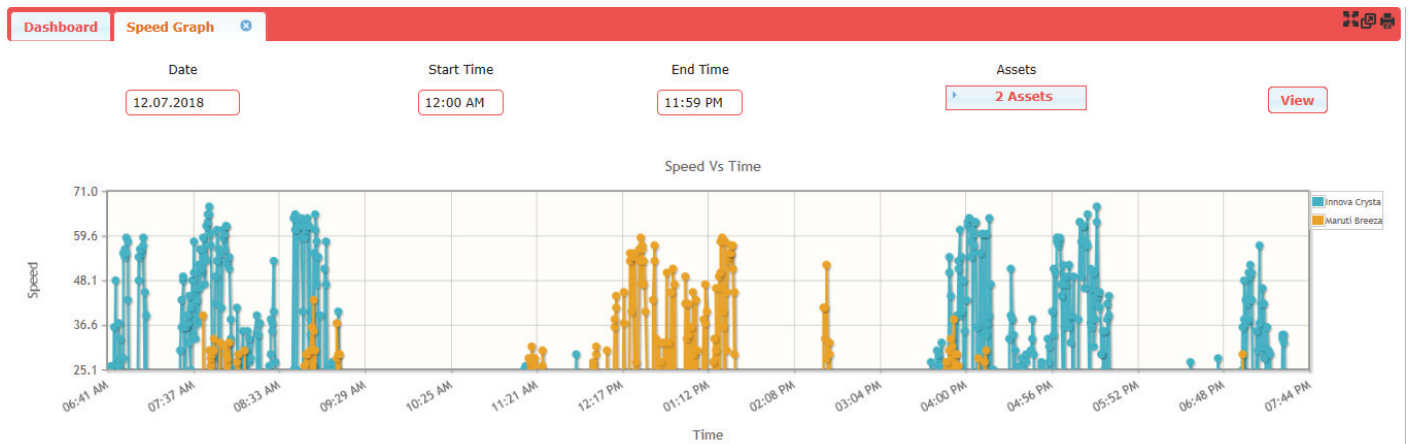


Figure 2. Graphical representation of the different speeds at which different vehicles traveled on a given day

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## 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 later period of well life;
- (iii) Magnetic Particle Test on the threads and body of tubulars.

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## 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 cleanup from the United States Coast Guard (USCG) guidelines have also been adopted. An option for shore clean up & separation, and disposal of oil & debris as per the IMO Manual on Oil Spill Response, Volume 4 is 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.

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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 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 oils 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 and monitor risks and to comply with Statutory Regulations and industry guidelines.
- Assess the situation and take timely and 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 specific duties. This includes 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.



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# Waste Management

## **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 brought onshore for disposal to waste recyclers.
- (iv) Waste lubricating and hydraulic oil are brought onshore and 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 brought onshore for disposal to authorized waste dealers.
- (vii) A waste management plan incorporating regulatory and best practice measures is implemented, and the staff responsible for waste disposal are provided training and information to ensure proper disposal of the waste.
- (viii) Inventory of solid waste generation and type are prepared, and disposal facilities are audited for suitability prior to the commissioning of the construction programme.

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, and 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 on site 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. An external agency also comes in to carry out a thorough cleaning of the facility everyday.

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## 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.

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.

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## Land Management

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.

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- 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 the 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 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.



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## 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 VOCs from diesel fuel.
- (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.
- (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).

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## 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:**

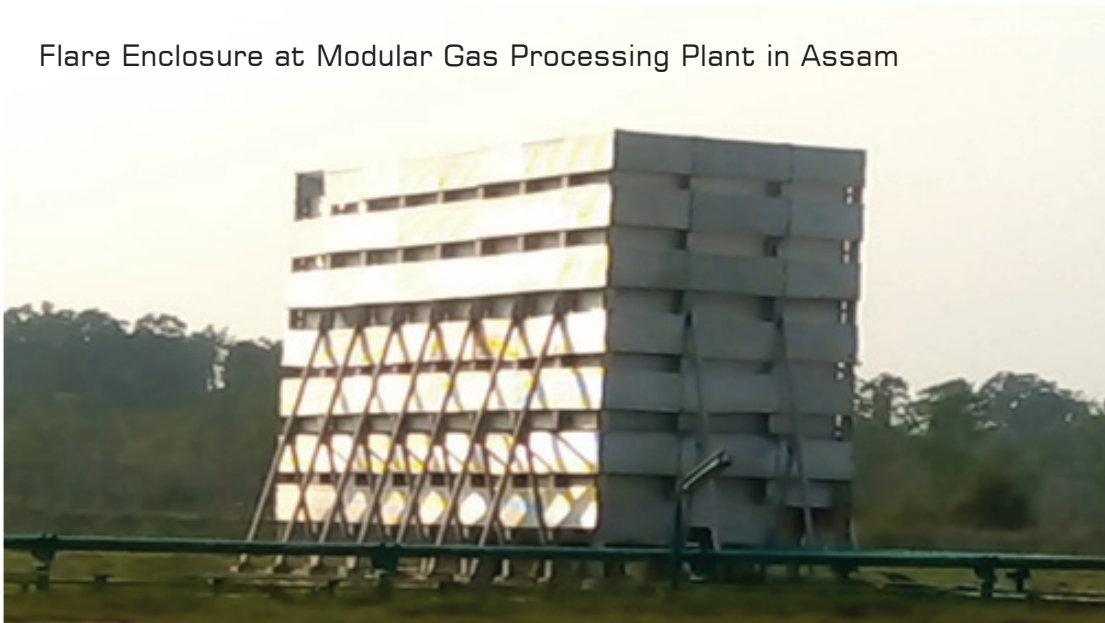
- Relief valves from high-pressure equipment such as Slug catcher, Separators, Sales gas to a power plant, and 1st Stage Separator
- Automated blow down valves from high-pressure systems
- Manual vents from high-pressure equipment

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 low-pressure relief vapour is not combusted within the HP tip, but instead 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.



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.



Flare Enclosure at Modular Gas Processing Plant in Assam

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# 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.
- (vi) The sanitary effluents onboard are treated in a suitably designed Sewage Treatment Plant (STP) before being discharged into the sea.



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## 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.
- (vii) The process area is paved to avoid the contamination of soil/sub-soil/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.

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## 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.
- (viii) Inlet and outlet mufflers are provided.

Apart from the measures stated above, during routine operations, operators/personnel working near noise sources are provided with 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.

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## 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 topsoiling 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 workforce has minimal impact on the local population.

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- (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, any 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 topsoiling 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.
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  - (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.

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## 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.

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## 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 six 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
- Ensuring environmental sustainability, ecological balance, wildlife conservation
- Rural sports, Paralympic and Olympic sports
- PM/CM relief funds, Disaster relief work etc.
- Rural Development Projects

All projects aim to create employment and socio economic benefit wherever possible. As part of the company's efforts to improve quality of life in the areas surrounding its PY-1 asset, the company has taken up initiatives such as hosting a plastic ban awareness campaign, wellness camps, career guidance workshops, and distributing school bags and sports equipment to a school in Veppancherry. Additionally, the top 5 students from the 10th, 11th and 12th grades of the village school are awarded cash prizes every year.



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Other projects include construction of a classroom for 120 students at Powai High School in the Tinsukia District in Assam; installation of solar street lamps in and around the company's area of operation in Dirok to help around 450 households; an initiative for woman empowerment called "Mahila Swaniyojan" to provide socially and economically backward women vocational training in embroidery and tailoring, thus creating employment opportunities for them; World Environment Day on the theme 'Beat Plastic Pollution' was observed by HOEC with the support of Local NGO, Sanjeevani North East Socio Economic Welfare Society at Margherita Civil Hospital; summer education camp at Powai High School; construction of a 2-kilometre paver cement block road connecting Aughbandha village to the Margherita – Tinsukia highway; and construction of three furnished classrooms at Aughbandha Inner Primary School.



Inauguration of a classroom built by HOEC at a school in Assam



A 2-kilometre paver cement block road connecting Aughbandha village to the Margherita – Tinsukia Highway



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## 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 & 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



**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