



GAIL (India) Limited
India's **Youngest** Maharatna

Rejuvenate | Resonate | Redefine



Sustainability Report
2016 - 17



Rejuvenate | Resonate | Redefine

On the energy spectrum, there is a fresh wave of building energy highways to new geographies, thus opening immense opportunities of inclusive growth with better environment. In its bid to transform lives by transforming the gas based economy to be more vital, India has embarked on its renewed journey to harness the clean and green potential of the natural gas. After withstanding the challenges of the adverse market scenario due to mid-year oil market crash, GAIL is all set to rejuvenate its operations and projects roll-out with utmost safety consciousness and speedy implementation with its rebounding zest.

We, as a central public-sector enterprise, have a key role in resonating country's aspirations to achieve socio-economic growth with sustainable development. We are working towards a sustainable energy mix as the country's energy demand will grow three times by 2030. While rebounding further on the strengths of a resilient infrastructure and delivery system in place, we take pride in becoming the harbinger of prosperity and socio-economic growth by echoing its positive vibes with all its stakeholders to transform the lives of millions of people who can look forward to a cleaner fuel and creating positive value.

We are committed to redefine our role in developing an integrated energy eco-system and work with the Government of India to unfold the gas grid through Urja Ganga to make gas a preferred fuel in the eastern part of the country. Also, we have expanded our business operation by importing LNG additionally and augmenting production of petrochemical polymer in variety and volume. To rejuvenate the energy sector with appropriate policy, economic, financial, and new technological interventions, all stakeholders need to resonate a common resolve to redefine an overarching energy mandate.

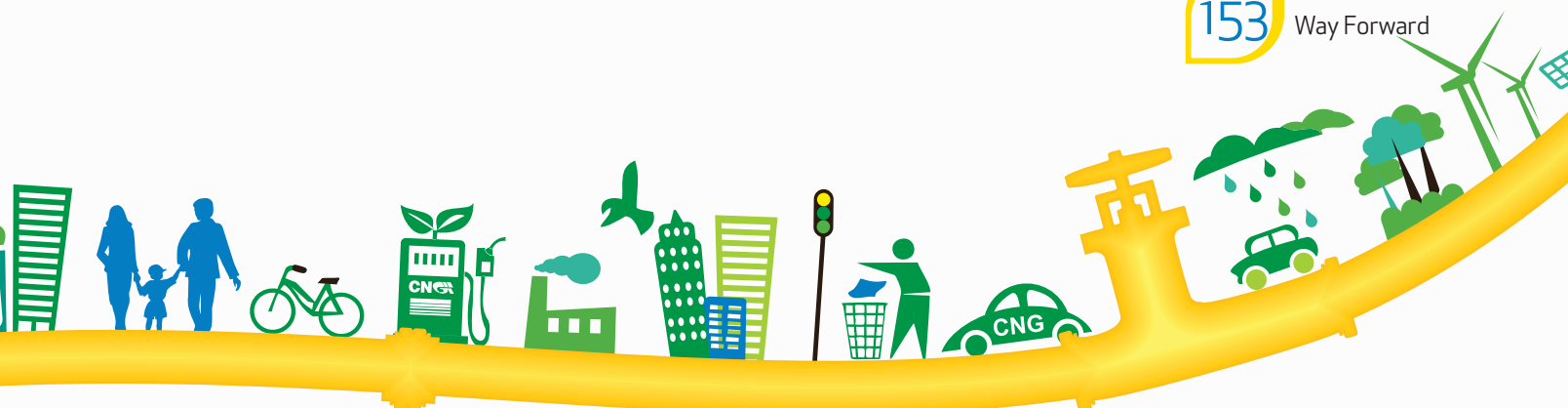
The theme **Rejuvenate, Resonate, Redefine** of the SR 2016-17 defines our spirit aptly with which we are propelling forward to deliver the potential of our capabilities locally and globally.





Content

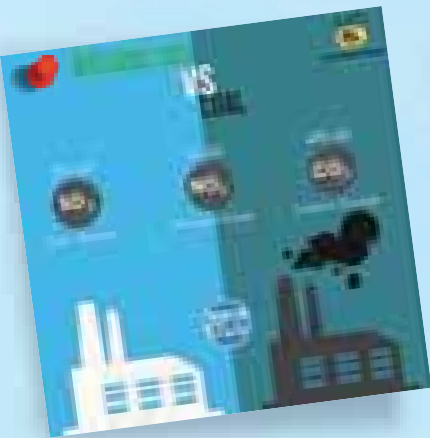
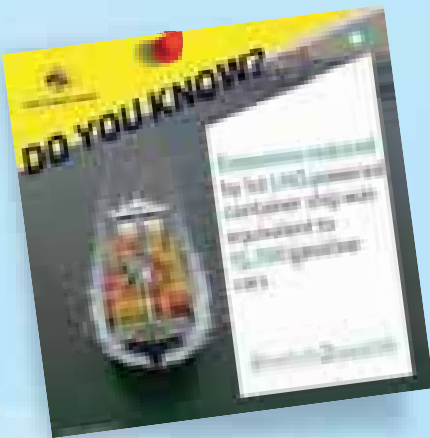
	1	Do you Know Pages
13	Our Commitment to Sustainable Development Goals	17 CMD's Message
	19	About The Report & About GAIL
27	Corporate Governance & Risk Management	39 Sustainability Strategy
43	Stakeholder Engagement and Materiality	53 Operational Excellence
	75 Health and Safety	87 Business Growth & Profitability
101	Public Policy and Advocacy	111 Stakeholder Relationship Management
	123 Human Capital & Practices	131 Performance Snapshot
	139 Assurance Certificate	142 Glossary
144	GRI Content Index	151 Linkages with NVG SEE Principles
	152 Linkages to API/IPIECA, UNGC, ISO 26000 Principles	
	153	Way Forward



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Natural Gas- for a low carbon future





Energizing Tomorrow with Cleaner fuel





Energizing Tomorrow with Cleaner fuel



GAIL is executing INR 20,000 crore worth of projects in which **4,000 km of pipelines will be laid in the next 30 months** to boost India's pipeline infrastructure. These include the Vijaipur to Phulpur pipeline, Jagdishpur-Haldia-Bokaro-Dhamra pipeline (JHBDPL) and Kochi-Koottanad-Mangaluru-Bengaluru Pipeline (KKMBL) project. The Vijaipur to Phulpur pipeline shall provide the gas feed to the ongoing prestigious 2655 Km long Jagdishpur-Haldia-Bokaro-Dhamra pipeline (JHBDPL) project of GAIL, also known as the 'Pradhan Mantri Urja Ganga' project, inaugurated by Hon'ble Prime Minister of India in July 2015.

The JHBDPL is a Rs 13,000 crore project. Work has started on the Kochi-Mangaluru pipeline. GAIL is also refurbishing its old pipelines in Gujarat, which are 40 years old, and also in the Cauvery and Krishna Godavari basins. The focus is on expanding last-mile connectivity to houses and networks in cities.





Energizing Tomorrow with Cleaner fuel



GAIL's Natural Gas Spur Pipeline to Bhubhaneshwar, Cuttack & Paradip inaugurated by Hon'ble Minister, MoPNG, Shri Dharmendra Pradhan



Energizing Tomorrow with Cleaner fuel



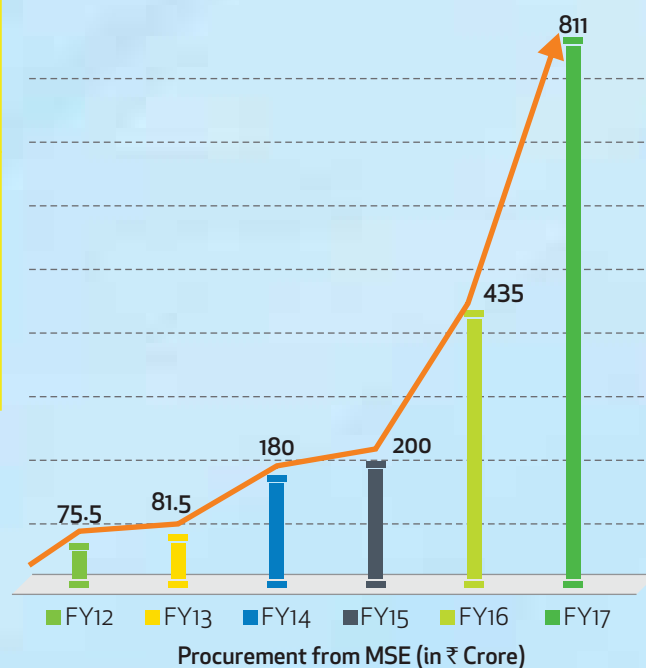
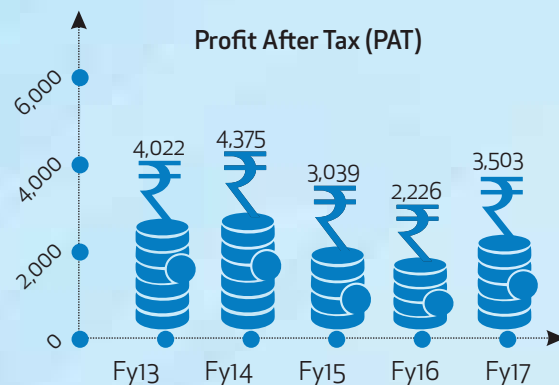
Advantages of CNG vehicles over Diesel vehicles:

- CNG vehicles are more environment friendly in comparison to BS – IV compliant diesel vehicles due to lesser Sulphur content, lower NOx emissions, lower carbon dioxide emissions, lower visible PM / black soot and greenhouse gas emissions.
- CNG vehicles increase life of lubricating oils as CNG does not contaminate and dilute the crankcase oil.
- In CNG vehicles, there are no fuel losses from spills or evaporation as CNG fuel systems are sealed.
- CNG buses are more economical than diesel busses in the long term. A cost benefit analysis between new BS IV compliant diesel busses and CNG busses shows that new CNG busses save approx. 12% of cost in long term.





Energizing Tomorrow with Cleaner fuel



- Highest ever sale of ~577 KTA of Polymer including export of ~14 KTA
- GAIL signs swap deal for U.S. LNG to swap ~0.6 MTPA of LNG
- NG Marketing and Transmission volumes are up by 10% & 9% to 81.2 & 100.4 MMSCMD respectively in FY 16-17 vis previous FY

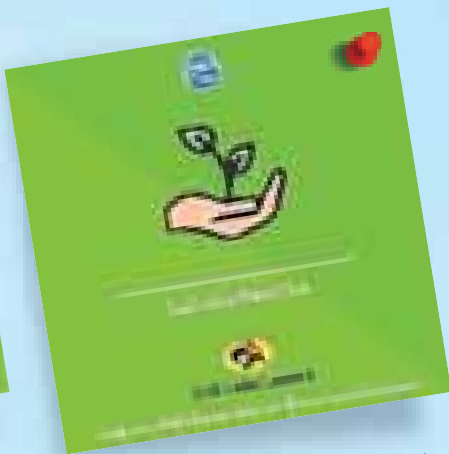
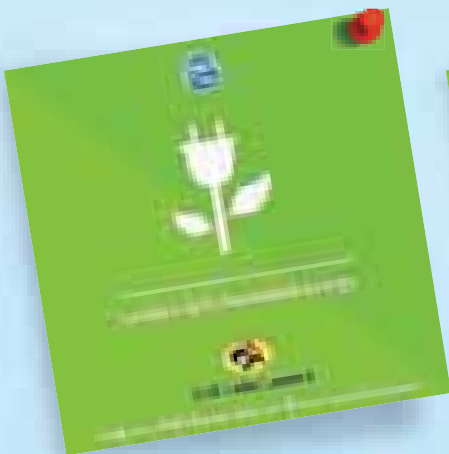
GAIL's Talcher JV of estimated cost of Rs.11611 crores will be the 1st Coal Gasification plant for production ammonia/urea in India. Talcher JV has achieved a great milestone of Environmental Clearance recommendation by Expert Appraisal Committee constituted by MoEF&CC



Energizing Tomorrow with Cleaner fuel



- GAIL commissioned India's second largest rooftop solar PV power plant of 5.76 MWp at its Petrochemical Complex at Pata, Uttar Pradesh
- Over 79 Lakh KWh of electricity generation is targeted annually for captive use
- 6300 TPA carbon emission reduction
- Step under 'Make in India' with Indian vendors entrusted for manufacture, supply and execution





Energizing Tomorrow with Cleaner fuel



HSE score of 92.94 during FY 16-17, well above the MoU target of 90.



133 Quality Circle projects registered with 110 success story resulting in cost saving INR 10.43 Crores





FantasticPLASTICS



GAIL's polymer products provides a wide choice of grades with consistent and reliable quality to its customers.

- Gas based Petrochemical Complex at PATA
- 70% equity in joint venture company Brahmaputra Cracker & Polymer Limited (BCPL) in Dibrugarh
- GAIL has acquired equity in OPaL's Greenfield petrochemical project at Dahej





Creating Value Beyond Business





Creating Value Beyond Business



Switch2Swachh



Spreading Smiles





Global Recognition



- Reaffirmed the highest domestic credit rating of AAA from ICRA,CARE and CRISIL and India Rating.
- GAIL participated in 7 domestic and 1 international investor conference organized by top brokerage houses of the country.
- GAIL also organized two day Plant visit (Auraiya Compressor Station





Our Commitment to United Nations' Sustainable Development Goals (SDGs)



On 1 January 2016, the Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development officially came into force. Over the next fifteen years, with these new Goals that universally apply to all, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind.

The SDGs are a collection of 17 global goals set by the United Nations. The broad goals are interrelated though each has its own targets to achieve. The total number of targets is 169.

"Just as our vision behind Agenda 2030 is lofty, our goals are comprehensive. It gives priority to the problems that have endured through the past decades. And, it reflects our evolving understanding of the social, economic and environmental linkages that define our lives... The sustainable development of one-sixth of humanity will be of great consequence to the world and our beautiful planet."

Sh. Narendra Modi, Prime Minister of India



GAIL as a responsible corporate citizen and Government undertaking is committed to the achievement of SDGs.

Our efforts contributing to SDGs are mapped in the subsequent section of this report.





Linkages with Sustainable Development Goals (SDGs)





Initiatives	Sustainable Development Goals	Page Nos.
Ujjwal (Education Centric Initiatives)		19
GAIL Unnati (Rural Development & Infrastructure)		19, 86
Shrijan		121, 122
GAIL Pankh (Energising Startups)		75
SWACHH BHARAT		108, 121, 123
Project WaSH		122
Landfill Gas pilot project		74
Air Force Wives Welfare Association (AFWWA) Project		120





Initiatives	Sustainable Development Goals	Page Nos.
Green Building	 	59, 67, 111
SANCHAY		101
Quality Circle initiatives		73
Solar Power Plant	 	59, 73, 97
Birthday, new joinee and transferred employee tree plantation program	 	70, 73
Indo-US strategic research initiative		74
Partnership with TERI on Climate Change	 	66, 110





CMD's Message



GAIL is also working with the millennial generation and public at large to create awareness of pollution and to implement mitigating actions for ensuring 'Clean Sky' under 'Hawa-Badlo' campaign across the country.



'Rejuvenate, Resonate, Redefine' is comprehensive report on GAIL's

Sustainability initiatives for the seventh successive year. We are into exciting times with concurrent possibilities playing out in the energy landscape. Industrial era remains deeply dependent on various fossil forms extracted from the planet. Industrial architecture is now being reshaped by sweeping technological shifts deployed to harness infinite energy reserves of solar and wind.

Our sustainability initiatives are expanding. Recently, GAIL installed India's second largest solar PV rooftop of 5.76MWp at the country's largest natural gas based petrochemical complex at Pata. Eight million units of captive generation

would contribute to reducing carbon footprint equivalent to annual GHG emission from 1350 passenger vehicles or burning over 3 million tons of coal. The project has a unique stamp of 'Make in India' in its entirety.

Progress under the 'Pradhan Mantri Urja Ganga' natural gas infrastructure project has been encouraging in many ways. City gas distribution has commenced at Bhubaneswar and city networks at other locations across the Jagadishpur-Haldia-Bokaro-Dhamra pipeline route are expected to be rolled out shortly. The trunk pipeline segment from Barauni to Guwahati too has

received regulator's acceptance for integrating into the Eastern India network system. These initiatives shall enable the eastern and north-eastern states to adopt a cleaner and reliable energy option for heating

applications at households as well as in industrial/commercial centres and also for transportation.

Recent months have also witnessed landmark directions from the judiciary in support of switching over to cleaner energy options such as natural gas, while ordering closure of solid and liquid fuels that threaten to corrode the environment. These strictures are applicable now across the national capital region and the adjoining States and such directions would entail upon entities marketing natural gas operating in these regions towards ensuring speedy connections to industrial and commercial consumers on priority.

The momentum for switching over to cleaner energy forms and embracing efficient technology is on the rise across the world, largely led by the ground swell of the public opinion with actionable support from the

2nd LARGEST
Rooftop Solar in India

5.76
MWp at Pata





governments. We need to accelerate our collective efforts to cut down the annual GHG emissions by half the 41 Giga tons by 2030 and also improve water efficiency through multi-pronged actions. GAIL has been supportive of technologies such as natural gas run fuel cell for reliable power generation that is not just benign on the environment but also efficient by several folds over conventional technologies.

**Moving towards
15-20% mix of natural gas
in the primary energy
basket could help achieve
India's aspiration under
COP framework at
manageable
investment**

A mix of cutting edge emerging technologies and renewable energy systems are suited to be deployed on a distributed model unlike conventional energy. Natural gas advantageously integrates with distributed energy formats.

**GAIL is now the a part of
'FTSE4 Good
Emerging Market
Index'**



Our plants are also working on energy efficiency benchmarks in collaboration with Bureau of Energy Efficiency to set standards of carbon emissions and specific energy consumption across petrochemicals sector. GAIL's state-of-art technologies that are now stabilised in operations are expected to clock higher efficiency in the times to come. The company's entry into the coveted group of 'FTSE4 Good Emerging Market Index' demonstrates our strong commitment to the environment, governance practices and social engagement are measured against global standards.

GAIL is also working with the millennial generation and public at large to create awareness of pollution and to implement mitigating actions for ensuring 'Clean Sky' under 'Hawa-Badlo'

campaign across the country. Over 20 million has been the outreach in a short span and the response is over-whelming.

Year after year, we have firmed our commitment to deliver growth and value for all the stakeholders as we continue to bridge climate action imperatives & growth aspirations.

I convey my sincere gratitude to GAIL's stakeholders for extending their precious support and belief in GAIL's endeavours towards creating opportunities and realising possibilities of sustainable growth. This compilation captures our journey and sustainability efforts for your keen study. Your invaluable feedback shall immensely help us in shaping a better tomorrow.

**B C Tripathi,
Chairman & Managing Director,
GAIL (India) Limited**



CHAPTER

01

About The Report & About GAIL



Operates $\frac{3}{4}^{\text{th}}$
of the total NG
transmission in India



Contributes
more than $\frac{3}{5}^{\text{th}}$
of the natural gas
sold in India



A view of GAIL Petrochemical Complex at Pata, Uttar Pradesh



About the Report

'Rejuvenate, Resonate, Redefine.' exhibits our approach to withstand the challenges of the adverse market scenario and seize the opportunity of inclusive growth with value creation for our stakeholders. In its seventh year of publication, our Sustainability report for FY 2016-2017G4-29 and the third Report in accordance with the "Core" G4-32 option of the Global Reporting Initiative (GRI-G4) Guidelines.



The report highlights our performance on economic, environmental, and social parameters and significant activities for the fiscal year 2016-17. The GRI content index on pages 98 contains a comprehensive reference to GRI performance indicators and standard disclosures.

This report adheres to the Nine principles of National Voluntary Guidelines (NVG) on Social, Environmental, and Economic responsibilities. The report has been developed in alignment with Oil and Gas industry guidance on voluntary sustainability reporting (2010), International Petroleum Industry Environmental Conservation Association (IPIECA), the global oil and gas industry association for environmental and social issues and the American Petroleum Institute (API), principles and disclosure requirements under United Nations Global Compact (UNGC), and ISO 26000:2010 guidance on organizational social responsibility along with GRI^{G4} guidelines.

There is constant evolution of expectations and requirements from the stakeholders in the current scenario of our dynamic and fast paced world. Thus, the focus areas have been determined through stakeholder engagement and materiality assessment exercise conducted at 10 of our locations, inclusive of project sites, offices and online surveys

involving different stakeholders. The details on stakeholder engagement are covered in relevant sections of the report. Materiality directs our sustainability odyssey and helps us in prioritization.

About GRI G4 Guideline

Global Reporting Initiative (GRI) is an independent international organization that pioneered sustainability reporting since 1997. GRI helps businesses and governments worldwide understand and communicate their impact on critical sustainability issues enabling real action to create social, environmental and economic benefits for everyone. GRI G4 is the version of the Sustainability Reporting Guidelines. The main focus of GRI G4 guidelines is to improve guidance on identifying 'material' issues – from different stakeholders' perspectives apart from improvements in the technical quality of the Guidelines' content from the previous version of the Guideline. GRI G4 Guideline has two 'in accordance' options of Core and Comprehensive. The General Standard Disclosures are to be reported for both options, with a larger number reported for the Comprehensive option for Standard Disclosures on an organization's strategy, analysis, governance and ethics. With the view of improving reader's referencing of Guidelines, we have mapped the GRI G4 indicators in the relevant sections of the report in Superscript format.



The above Design Frame is used through out this Report to Highlight New Information/ Initiative taken during FY 2016-17





Data Management Approach

This year's Sustainability Report covers data from April 2016 to March 2017. Each section of the report elaborates our performance through systems, processes, and infrastructure in reference to the various stakeholders and material aspects relevant to the chapter. In addition, we also reported on initiatives undertaken during the reporting year. Information has also been presented on new projects, intentions, and future plans. As these activities are under development and dependent on fluctuating market conditions, changes in regulatory decisions and geopolitical situation there is a degree of uncertainty as to their completion. The data presented in this report has been calculated using assumptions, standard guidelines and methodologies. Disclosures on these have been made wherever used. Data is further verified by the concerned department heads.

Our commitment to SDG

GAIL as a responsible corporate citizen and Government undertaking is committed to the achievement of SDGs. It is our consistent endeavor to create a positive value for our stakeholder while treading towards the goal of a sustainable future for the organization as well as the Nation. We aim to align our business goals with National and global priorities. With this perspective, we have tried to highlight few of our initiatives aligned to achieve the Sustainable Development Goals.

Report Scope and Boundary

Exploration and Production G4-23 operations have been added to the scope and boundary of this report. This report is India centric and excludes joint ventures, subsidiaries, leased facilities, outsourced operations, and other entities. The report content has been defined by consistent use of the principles of stakeholder inclusiveness, materiality, sustainability context, completeness, balance, comparability, accuracy, timeliness, clarity, and reliability.

Assurance

All our sustainability reports have been assured by external assurance agencies. Continuing the practice, this year's Sustainability Report has been assured by DNVGL. This is a Type 2 Moderate level assured report based on AA1000AS (2008) standard. The assurance process includes data verification at different sites of our company that will continue to help us improve its processes and data management mechanisms.

There is a dedicated website for GAIL Sustainability Report www.gailsustainabilityreport.com

List of operations included in the report ^{G4-5}



About GAIL



Natural Gas

- Over 11,507 Kms of NG Pipeline Sophisticated Gas Management System
- Pursuing for expansion, Participation in RGPPL (5 MMTA LNG Regasification Facility)
- Long-term Import Portfolio: 24 MMTA

Liquid Hydrocarbon

- 6 Gas Processing Plants producing LPG, Propane, Pentane, Naphtha etc.
- 2,038 Kms of LPG Pipeline Network
- LPG Transport Capacity 3.8 MMTA (2038 Km.)



City Gas Distribution

- Serving over 17,69,540 vehicles and 18,60,094 households through Subsidiary and Joint Ventures

Petrochemicals

- Domestic Market Share ~ 20 % (Including BCPL)
- Petrochemical Complex at Pata, (UP) with capacity of 0.81 MMTA
- Marketer of subsidiary BCPL's polymers
- Participation in OPAL



Power and Renewables

- 118 MW Wind Power Plant and 5 MW Solar Power Plant
- Participation in RGPPL (Capacity 1967 MW)

Exploration and Production

- A part of vertical integration
- Participation in 12 blocks (operator – 1 block)
- Discovery of hydrocarbon in 2 blocks
- Production of crude oil from 4 blocks
- Presence in Myanmar and USA





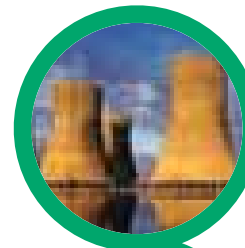
Contributes
more than
3/5th
of the natural gas
sold in India



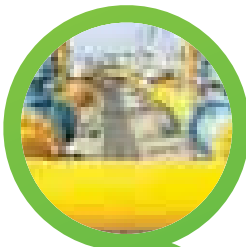
Produces
every
20th
LPG Cylinder
in India



Operating
more than
2/3rd
of India's total
CNG stations



Supplies gas
for about
3/4th
of India's gas
based power



Operates
3/4th
of the total NG
transmission in
India



Produces
1/5th
of the
polyethylene
produced in India



Responsible for
1/6th
of India's total
LPG
transmission

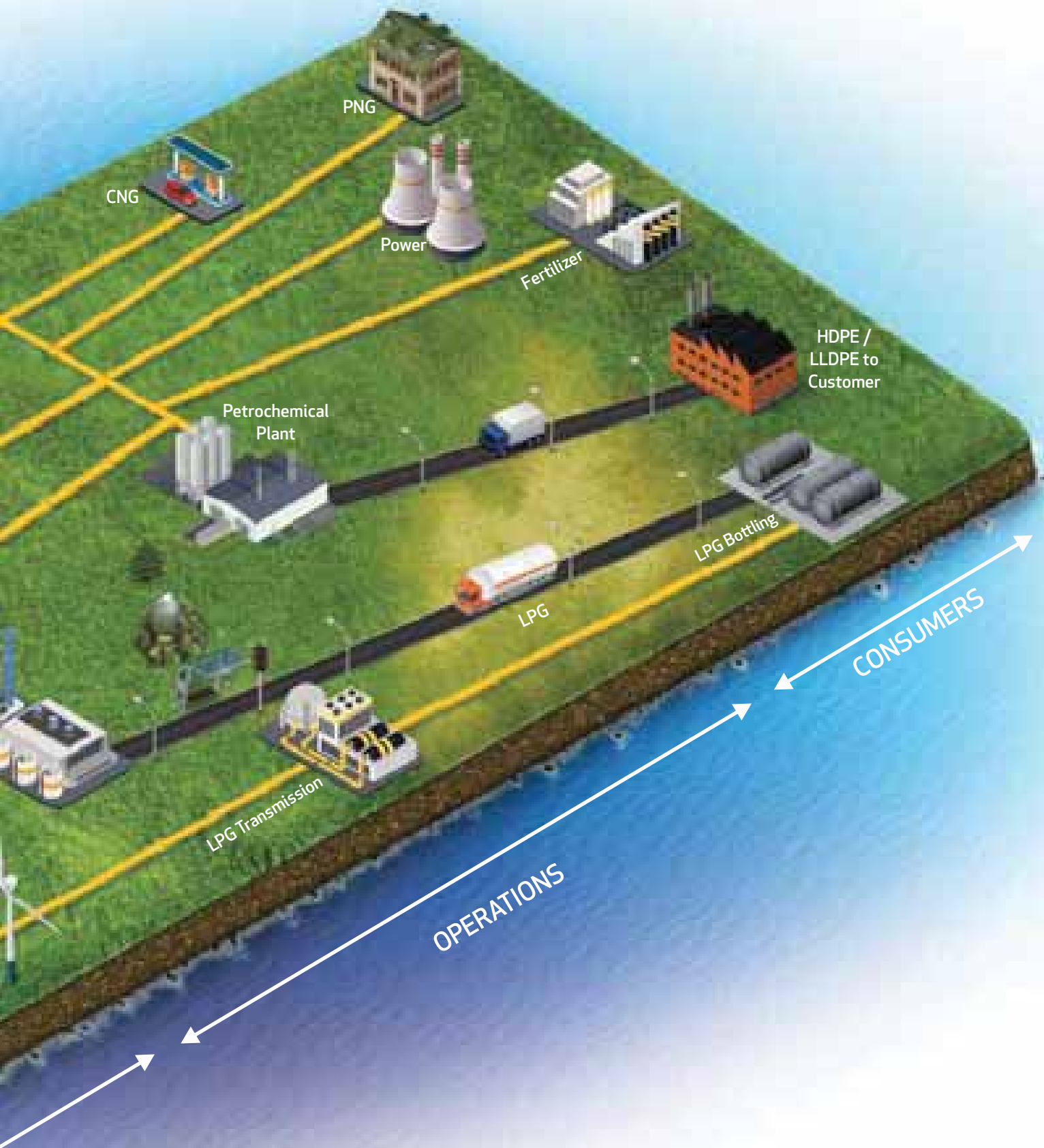


Supplies gas
for about
3/5th
of India's fertilizer
produced



GAIL's Supply Chain







Our Presence, Subsidiaries, and Joint Ventures

Domestic Subsidiaries

- Brahmaputra Crackers & Polymers Ltd. (BCPL) (70%)
- GAIL Gas Ltd. – GAIL's wholly owned subsidiary (100%), supplying to Dewas, Kota, Sonapat, Meerut and Taj Trapezium Zone, Firozabad, Vadodara & Panvel.

City Gas Distribution (CGD) JVs (% of equity)

- Mahanagar Gas Limited - MGL (32.50%)
- Indraprastha Gas Limited - IGL (22.50%)
- Bhagyanagar Gas Limited - BGL (49.97%)
- Green Gas Limited - GGL (49.97%)
- Central U.P. Gas Limited - CUGL (25%)
- Maharashtra Natural Gas Limited – MNGL (22.50%)
- Aavantika Gas Limited - AGL (49.97%)
- Tripura Natural Gas Company Limited - TNGL (48.98%)
- Vadodara Gas Limited (32.93%)

Through GAIL Gas Limited-

- GOA Natural Gas Private Limited
- Haridwar Gas Private Limited
- Kerala GAIL Gas Limited
- Andhra Pradesh Gas Distribution Corporation Limited

Overseas Subsidiaries

- GAIL (Global) Singapore Pte, (100%)
- GAIL (Global) USA Inc., (100%)
- GAIL Global (USA) LNG, LLC (100% subsidiary of GAIL (Global) USA Inc.)

Joint Ventures

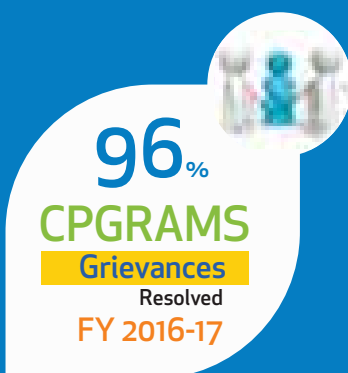
- Petronet LNG Limited (12.5%)
- GAIL China Gas Global Energy Holding Ltd. (50%)
- ONGC Petro Additions Ltd (OPAL) (49.21%)
- TAPI Pipeline Company Ltd (5%)
- National Gas Company "Nat Gas" (5%)
- Fayum Gas Company (19%)
- GAIL China Gas Holdings Ltd. (5%)
- Talcher Fertilizers Limited (29.67%)
- South-East Asia Gas Pipeline Company Limited (4.17%)



CHAPTER

02

Corporate Governance & Risk Management



GAIL's Natural Gas Spur Pipeline to Bhubaneswar, Cuttack & Paradip inaugurated by Hon'ble Minister, MoPNG, Shri Dharmendra Pradhan



Corporate Governance and Risk Management

We are committed to high standards of corporate governance and transparency which is paramount in establishing enhanced trust with the stakeholders. Our governance structure manifests its adherence to good governance principles such as transparency, accountability, responsibility, ethics, and integrity towards all our stakeholders. Good governance at GAIL is ensured through deployment of strategy and oversight by the Board of Directors. GAIL has a robust governance structure that lays and implements transparent policies, establishes systems, and processes for internal control and strengthens risk management framework thereby ensuring compliance with all applicable laws, rules, and regulations G4-42, G4-43. We maintain good governance practices in all aspects of the Natural Gas value chain.



Governance Structure



The principles on which our governance is based are efficiency and transparency. These are promoted by practicing good governance while decision making, clear roles and responsibilities for sustainable growth.

We are a Central Public-Sector Enterprise (CPSE). The appointment/nomination of all our Directors is done by the President of India, through the Ministry of Petroleum & Natural Gas (MoPNG). GAIL's strategic approach is steered by the Executive and Non-Executive Directors. Various Sub-Committees of the Board are constituted by the Board as required under statutory regulations and guidelines to facilitate smooth and efficient flow of decision making process.

The Board of Directors has approved the Delegation of Powers to CMD and Functional Directors. CMD has been empowered by the Articles of Association to delegate to executives below Board level. To ensure ethical

business we have established a Code of Conduct for the Board Members and Senior Management Personnel. Internal control is also a prime component of our governance model. We have implemented advanced systems and processes for proper functioning of the internal controls. We review our internal audit and compliance procedures intensively and efficiently. We comply with SEBI (Listing Obligations & Disclosure Requirements Regulations) 2015 and the Department of Public Enterprise (DPE) guidelines on corporate governance. The composition of our Board of Directors including the requirement of Independent Directors and consequential impact on composition of Audit Committee and Nomination & Remuneration Committee is undertaken as per the applicable statutory provisions. We also work with the Government of India for the appointment of requisite number of Independent Directors, including appointment of woman Director as per Companies Act, 2013. Details about the composition of the Board and its committees is available in the Annual Report for FY 2016-17 which

The ratio of our annual total compensation for highest-paid individual to our median annual total compensation for employees

₹ 2.99:1





is available at the given link here:
http://www.gailonline.com/final_site/IZ-AnnualReports.html

Performance evaluation of individual Directors including Independent Directors is to be done by the Government of India being the appointing authority. Transparency from the management instills confidence in our shareholders, potential investors, and third-party associates. Consequently, we continue to function while focusing on our decision-making processes pursuant to the very highest standards.

Remuneration & Incentives

The targets for physical, financial, non-financial parameters are prescribed in GAIL's MoU with the MoPNG. The Company's performance is evaluated against these targets and hence a composite score of individual parameters are defined. The composite score is one of the key variables in deciding the MoU rating which determines the quantum of variable pay for the year in the form of Performance Related Pay.

The ratio of our annual total compensation for the highest-paid individual to our median annual total compensation for all employees (excluding the highest paid individual) is 2.99:1. The Median percentage increase (from FY 15-16 to FY 16-17) in annual total compensation for all employees (excluding the highest-paid individual) is 0.78%. The total annual compensation from FY 15-16 to FY 16-17 for our highest-paid individual decreased by -5.39%.

Conflict of Interest

It is paramount for the maintenance of trust in public institutions and for good governance to determine and resolve

conflict of interest. We at GAIL avoid and manage the conflicts of interest at the Board level as per the description in the infographic.

Further, a policy has been formulated for dealing with Related Party Transactions as mandated under SEBI (LODR) Regulations, 2015 and is also hosted on the website of the Company

http://www.gailonline.com/final_site/IZ-Policies.html

Sustainability Governance

We, at GAIL are guided by the principles of accountability and transparency. In 2011, we formally began our

sustainability journey. We believed that although we were a few steps behind, taking small yet strategic steps in right direction with the dynamic leadership of the top management was even more imperative. The idea is to facilitate assessment of our impacts and subsequent value generated for our stakeholders by embedding aspects of sustainability in long-term strategy and day-to-day business decision making.

To establish a common understanding of terms, standards, and goals; we developed a Sustainability Policy to act as a fundamental building block for propagating responsible behaviour at GAIL. This policy integrates our vision and aspirations on economic, environment and social bottom lines.





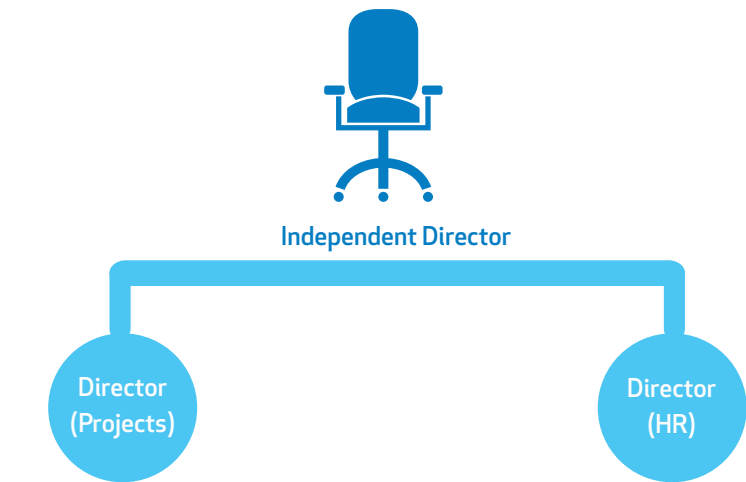
Sustainable Development Committee

We proactively took up our sustainability issues through active involvement of the Board-level Sustainable Development Committee, headed by an Independent Director with all the Functional Directors as members, to regularly monitor sustainability initiatives and performance. The Sustainable Development Committee (SDC) of the Board oversees the sustainable development agenda and performance, reviews the emergency response plan and the HSE performance. The SDC plans the organisational activities in a way to generate long-term value and assure responsible projects and operations. The SDC's work encompasses the ethical, social, and environmental issues. The SDC also reviews the emergency response plan and HSE performance. The SDC plans the organisational activities in a way to generate long-term value and assure responsible projects and operations.

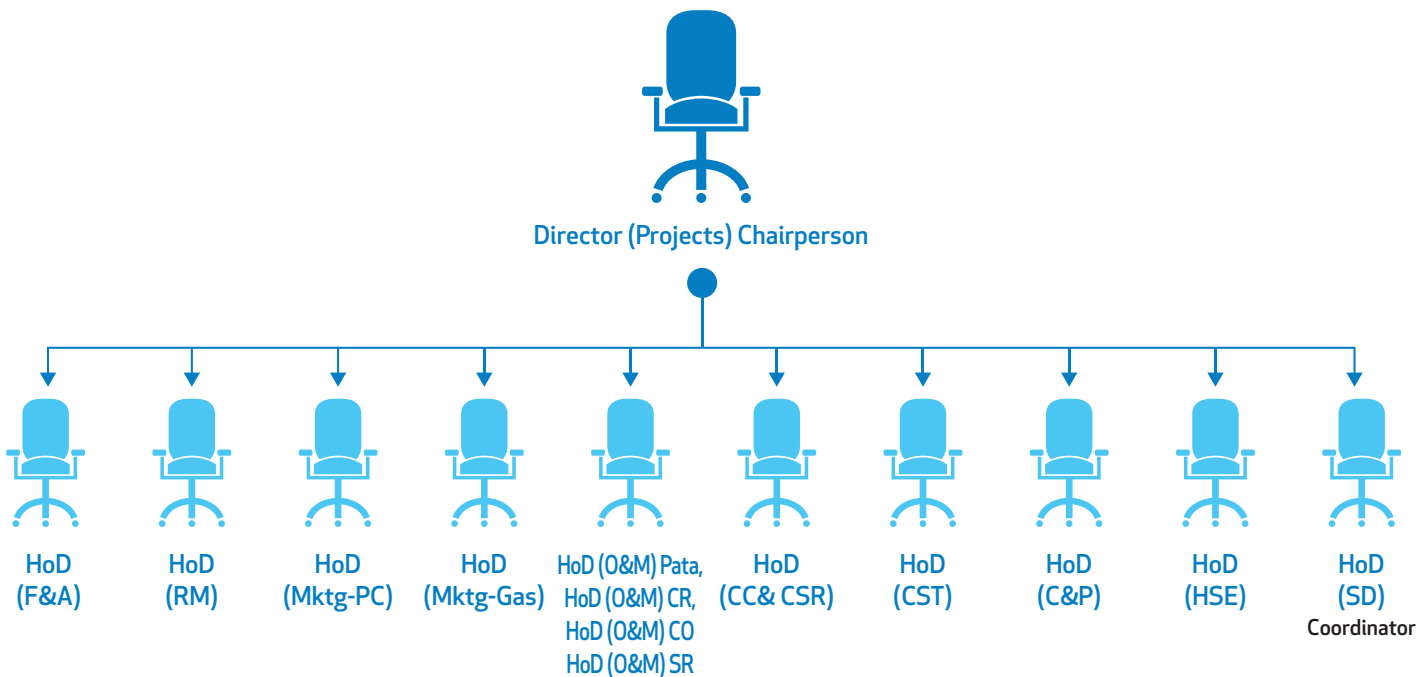
The SDC's work encompasses the ethical, social, and environmental issues. In 2016-17, the committee met twice and following are some of the key decisions taken:

- Approval of GAIL's 6th Sustainability Report for FY 2015-16, 'Nurturing Resilient Ecosystem'

- Capturing viewership of the GAIL's sustainability Report portal
- Steps to improve data management
- Initiatives to be taken to include other key stakeholder groups in stakeholder engagement and materiality process



Sustainable Development Steering Committee





Since, sustainability is essentially an umbrella concept involving various domains, a Steering Committee involving heads of departments was formed to plan, oversee, and implement on-ground sustainability activities. This committee has been instrumental in driving sustainability across GAIL's operations.

Subsequently, to effectively implementing the initiatives at site level, we have multi-disciplinary site-level committee along with focused Sustainability team working at Corporate level. This year a separate Sustainable Development Department headed by an Executive Director has been formed under the leadership of Director (Projects). This reinstates our commitment toward strengthening Sustainability especially covering our

operations and processes which working with new vigour to achieve our goals.

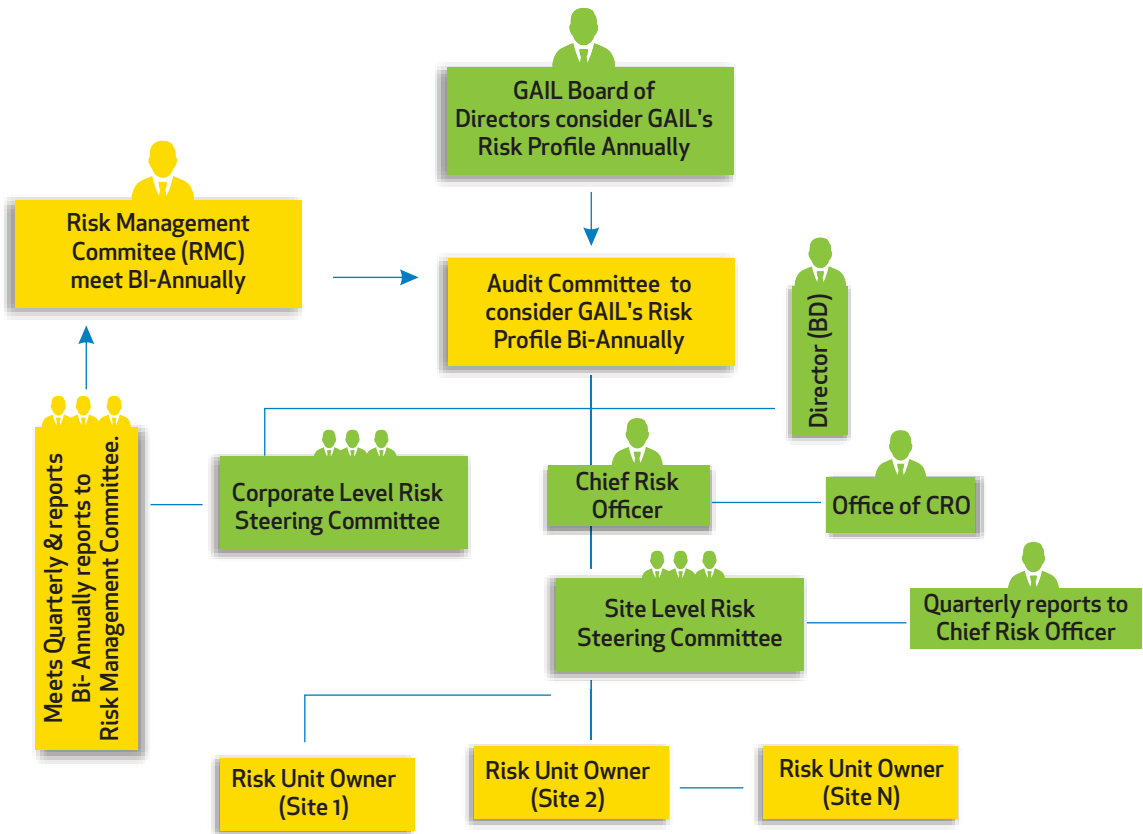
Risk management

We at GAIL have a robust governance structure which strengthens risk management framework thereby ensuring compliance with all applicable laws, rules, and regulations. It is crucial to determine and bear with a cluster of evolving technical, financial, regulatory, geopolitical, and environmental risks for sustainable business performance. The below figure depicts the risk management approach we follow at GAIL.

Risk management is integrated to corporate governance by the Organisation of Economic Co-operation & Development (OECD) principles of

corporate governance and SEBI (LODR) Regulations, 2015. Formulation and implementation of a risk management policy and determination of risks inimical to the organisation by the Board of Directors is a requisite of the Companies Act, 2013. Our Top Corporate Level Key Risks reviewed & updated every year to ascertain new and emerging risks arising from expanding business activities. Relating and contextualising various social, environment, and economic risks to just a financial year is difficult due to their uncertain and unpredictable nature. We realise the environmental impact of our operations and consistently make efforts to minimize/ neutralize the impact on community and society^{G4-EC2}.

Flow Chart for reporting, monitoring and reviewing



Flowchart for reporting, monitoring, and reviewing





We take all possible precautionary measure to ensure that our operations perform within permissible limits. We have a validated Risk Management Policy & Procedures. It is to protect and add value to our operations and our stakeholders with the objective:

To ensure sustainable business growth with stability and establish a structured and intelligent approach to Risk Management at GAIL. This would include the process for development and periodic review of the unit-wise Risk Registers and Databases to guide decisions on business risk issues. This would promote a proactive approach in analysis, reporting and mitigation of

key risks associated with the business to ensure a sustainable business growth.

We have a comprehensive Risk Management Framework in place which assists our business strategy and operations. Updation of the Risk Management Framework with new and emerging risks emanating from business expansion and interests is a continual process. Risk identification, Risk analysis, Risk evaluation, Risk prioritization, Risk treatment along with mitigation plans are reviewed and monitored periodically. Corporate Level Risk Steering Committee monitors the implementation of the Risk

Management Policy and Procedures.

Every employee of the company is recognized as having role in risk management for identification of risk to treatment and shall be invited & encouraged to participate in the process. There will be a Corporate Level Risk Steering Committee to determine Key Risks, communicate Policy, objectives, procedures & guidelines and to direct & monitor implementation, practice & performance throughout the Company. The Audit Committee & the Board will review the policy & procedures periodically.

The specific objectives of the Risk Management Policy are:



To establish a risk intelligence framework for the organization;



To ensure that all the current and expected risk exposures of the organization are identified, qualitatively and quantitatively evaluated, analyzed and appropriately managed



To establish ownership throughout the Organization and embed risk management as in integral part of the business rather than a stand-alone system



To enable compliance with the relevant legal and regulatory requirements and international norms



To help the decision makers of the organization explicitly take account of uncertainty, the nature of that uncertainty, and work towards a solution to address it



To assure demonstrable achievement of objectives and improvement of financial stability of the organization





Risk Management Framework applicable to all assets, plants & offices

Management responsibility

- High, Medium & Low categories of risks review by Chief Risk Officer & Site Level Risk Steering Committee (SLRSC)
- As per approved Risk Management policy, Corporate Level Risks Steering Committee CLRSC) is required to review the status of Corporate Level Key Risks on quarterly basis. Prior to placing before Audit Committee, the status is deliberated in Risk Management Committee (RMC) on Bi - Annual basis. The status is put up to the Board Annually
- Audit Committee & Board of Directors who also review the policy and procedures periodically
- The unit level risk steering committee maps, monitors and formulates mitigation measures of Key risks on a quarterly basis including social and environmental risks and non-key risks on annual basis
- Risks associated with specific groups are managed by respective dept. & management is updated on the same

Objectives of Risk Management Policy and Procedure

- Establish risk intelligence framework, ownership and embed risk management in the business
- Aid decision makers to take account of uncertainty and find solutions
- Qualitatively and quantitatively analyse, evaluate and manage current and expected risk exposure
- Compliance with relevant legal and regulatory requirements and international norms
- Demonstrate achievement of objectives and improvement of financial stability

Risks identified and deliberated in the Corporate Level Risk Steering Committee

- Corporate Risks are illustrated in the table below and the other key risks from sites/ corporate functions are presented from time to time along with new emerging risk

Measures taken to mitigate exposure to risk

- Advocacy through top management
- Specialized Corporate Level Risk Steering Committee to deal with risks
- Periodic review of Top Corporate Level Key Risks
- Risk management policy
- CRO office institutionalize risk management professionals throughout GAIL at all levels

In the changing business scenario and expansion of GAIL's operations into various other activities, business risk and their mitigation plans is re-assessed on regular basis.

The top key Corporate Level Risks for GAIL are as under:





Risk Category	Risk Description	Key Mitigation Measures
Market	Take or pay risk on long term LNG tie up.	<ul style="list-style-type: none">• Sale Purchase agreement in International and National markets• Initiatives taken at Government level• Tie-ups with OMCs and fertilizer plants• Sale in International Market through GAIL or its affiliates
Financial	Enhancement of Corporate guarantee provided by GAIL to its subsidiaries and JVs.	<ul style="list-style-type: none">• Monitoring of Project targets and milestones• Management reviews on Procurement & Deployment plan and Marketing Strategy
Market	Under-utilization of pipeline due to low downstream drawl and low pipeline capacity trade	<ul style="list-style-type: none">• Target liquid fuel customers along GAIL's pipeline network• Last mile Connectivity• Flexibility in terms of Contract agreement• Uniform guidelines for faster connectivity of CGD• Regular customer meets• Guidelines for Ship or Pay related issues
Strategic	Delay in Project Execution due to local resistance in ROU opening/permanent land acquisition.	<ul style="list-style-type: none">• Project specific liaisoning with relevant stakeholders• Awareness and sensitization campaigns for local populace• Effective CSR projects
Regulatory / Statutory	Risk of Regulatory framework	<ul style="list-style-type: none">• Public advocacy• Boundary Management• Business Intelligence• Strategy Development• Capacity building of concerned executives
Market	Reduction in profitability of Petrochemicals	<ul style="list-style-type: none">• Focus on Polymer Marketing & Expansion to new markets• Enhancing coordination between Zonal offices and Production unit• Effective sales and Production planning• Monitoring of Market dynamics in terms of pricing, demand, consumption benchmarks• Cost optimization

Internal Control Systems and their Adequacy

Our Internal Control System (including Internal Financial Controls with reference to Financial Statements) ensures efficiency, reliability, completeness of accounting records and timely preparation of financial and management information.

Furthermore, compliances of all applicable laws and regulations, optimum utilisation and protection of our assets is also ensured. An Internal Audit department, consisting of professionally qualified persons from accounting, engineering and IT domains is deployed at GAIL. One of the global best practice followed by us is the Functional steering of the Internal

Audit department by the Audit Committee and administratively by the CMD.

The business processes and controls are reviewed through risk focused audits by the Internal Audit function and the findings are scrutinized by the committee of the Board. Internal Financial Control is an ongoing process to identify, assess effectiveness and





Unveiling of GAIL Sustainability Report FY 15-16 by GAIL Board

monitor performance for continuous improvement. We have formulated Internal Financial Control System in various business processes/segments, with respect to the size and nature of business for ensuring the efficient operations of GAIL's business, safeguarding of its assets, prevention and detection of frauds and errors, accuracy, and completeness of accounting records and timely preparation of reliable financial information.

Assistance from external consultants is sought to ascertain the endurance and effectiveness of internal controls including operational activities and to update the existing framework for further improvements. Further, we also have in place sufficient internal financial control system which is operating effectively.

Ethics & Integrity

We at GAIL have ethics and integrity embedded as a core value in our work culture. All our directors, management employees/non-management employees, and contract employees are required to comply with all applicable

laws. These laws including, anti-corruption, anti-trust, anti-boycott, trade sanctions and export controls laws, as well as laws of other countries applicable to our business.

We have formulated a Code of Fair Disclosure and Conduct- Practices and Procedures for Fair Disclosure of Unpublished Price Sensitive Information and Code of Conduct to Regulate, Monitor and Report Trading by Insiders - Insider Trading Code in line with the SEBI (Prohibition of Insider Trading) Regulations, 2015. In accordance with SEBI LODR Regulations, 2015 a Code of Conduct for the Board Members and Senior Management Personnel also has also been framed. The Audit Committee on a quarterly basis reviews the details of Related Party Transactions (RPT) entered by the Company, referring to the requirement stated under SEBI LODR 2015 and the Companies Act, 2013. Approval of the Audit Committee and/or Board and/or Shareholders as required is taken for RPTs. To facilitate the investors to make well-informed investment decisions and enable disclosure of information in a timely, adequate, and accurate manner a Policy

for Determination of Materiality and Disclosure has been adopted by us. Regulation 30 of SEBI LODR Regulations, 2015 define the criteria for determining materiality of events and information. We adhere to a Related Party Transaction Policy while transacting with our related parties, which are framed in accordance with Regulation 23 of the SEBI LODR Regulations, 2015 and the Companies Act, 2013.

The bribery and corruption related issues are dealt in accordance with Central Vigilance Commission (CVC) guidelines and related circular. These have a mandate extending to wholly owned subsidiaries and Joint Ventures of GAIL where the equity of GAIL is more than 50%. All GAIL employees are obliged to adhere to the GAIL Code of Conduct; Conduct, Discipline, and Appeal (CDA) Rules /Standing Orders, Fraud Prevention Policy, and Whistle Blower Policy. This includes employees who are on secondment or deputation to the Joint Venture Companies, Subsidiaries, Government Bodies including autonomous institutions, Regulatory Authorities etc. The Integrity Pact and Fraud Prevention Policy extends to suppliers, contractors among others.

In order to promote transparency and accountability, an appropriate mechanism has been set up across the Company in line with the Right to Information Act, 2005. Your Company has nominated CPIO/ACPIOs/ Appellate Authorities at its units/offices across the country to provide information to citizens under the provisions of RTI Act.

GAIL has hosted RTI Guidelines and related information on its site and these may be accessed at







http://www.gailonline.com/final_site/RTI.html. Besides, MIS Report on RTI Applications, Record Retention Schedule and latest RTI Audit Report had also been hosted under the same link.

Further, GAIL has been made 'LIVE' on the GoI's Online RTI Portal from July, 2016 and ever since we are providing information online, apart from

System of pegging of the percentage of fee payable to the Architect / Consultant on original contract value has been implemented

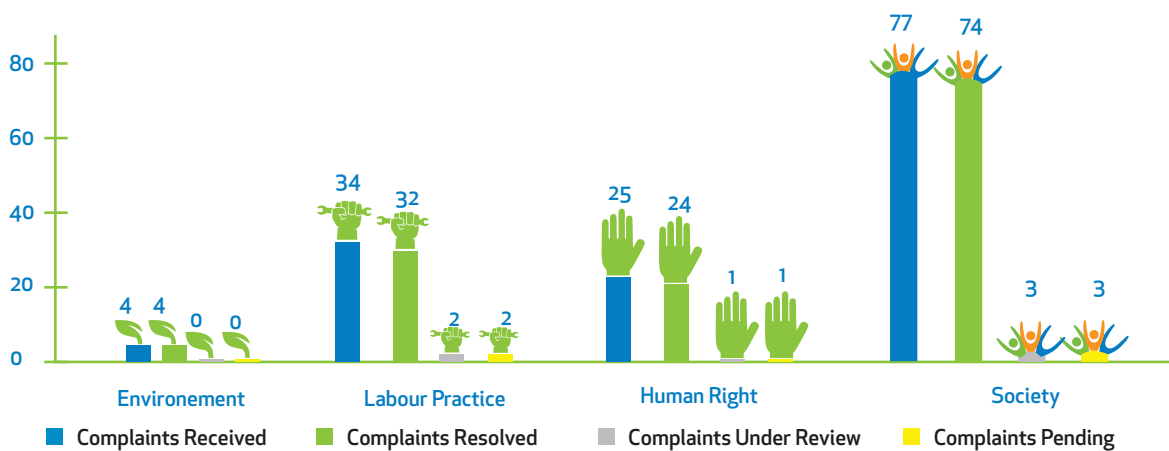
Timely appointment of Third Party Inspection Agency (TPIA) before award of the jobs / works wherever required

providing the requested information offline, through physical RTI applications.

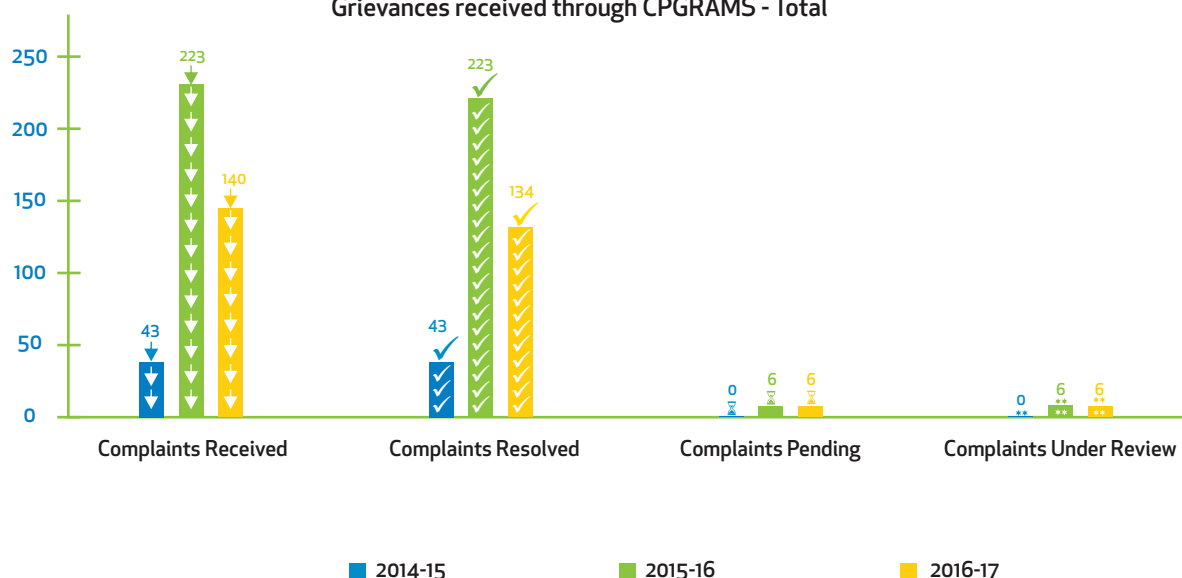
Anti-corruption and Bribery

Corruption and bribery diminish public accountability and thus increases the risks in business by endangering the

Grievances for FY 2016-17 received through CPGRAMS



Grievances received through CPGRAMS - Total





organization's values and reputation. Corruption is anti-competitive and it hikes the overall costs of doing business, also breeds skepticism and ambiguity amongst the stakeholders. Bribery undermines the long-term prosperity and the best interests of the investors as well.

We have formulated a Code of Fair Disclosure and Conduct- Practices and Procedures for Fair Disclosure of Unpublished Price Sensitive Information and Code of Conduct to Regulate, Monitor and Report Trading by Insiders - Insider Trading Code in line with the SEBI (Prohibition of Insider Trading) Regulations, 2015. A Code of Conduct has also been formulated for the Board Members and Senior Management Personnel in line with SEBI LODR Regulations, 2015. The Audit Committee reviews the details of Related Party Transactions (RPT) entered by the Company, on quarterly basis as per the requirement stated under SEBI LODR 2015 and the Companies Act, 2013. Approval of the Audit Committee and/or Board and/or Shareholders as required is taken for RPTs.

To ensure transparency in our systems and processes for the benefit the vendors and suppliers, implementation of various initiatives such as e-tendering, e-payments, and Bill Watch System etc. has been done. For the prevention of corruption and endorsing good governance, number of system reforms were implemented enabling effective utilization of its resources. Listed below are some of these:

To inculcate a culture of adherence in a participative manner amongst all the

key stakeholders, we observe Vigilance Awareness Week annually at all our locations. The celebrations of the week include activities like competitions comprising of poster painting, essay and slogan writing, online quiz, and debates to spread awareness among GAIL employees and related work force. There are other activities organized at the different work centres e.g. banners/ posters/ painting displays, marches and rallies with NGOs as per guidelines received from the CVC. We have a magazine titled 'JAGROOK' hosted on our intranet which contains CVC circulars, articles and case studies related to vigilance.

To assess our business units for corruption related vulnerability total of 38 Chief Technical Examiner (CTE) type inspections of various works were also carried during the reporting year. During the period under review, 97 complaints were received, out of which 77 (i.e. 79.38 %) have been resolved. ^{G4-505}

Further Through a structured online Grievance redressal forum of Samadhan, Stakeholders' issues are also amicably resolved. Details of Samadhan is shared in Stakeholder Relationship Management Chapter.

Grievance Redressal

We are devoted to ensuring the satisfaction of our stakeholders by providing them services in a transparent form by endorsing the principle values of corporate governance and ethics. However, the stakeholders can report the unprecedented areas of concern in the event of any dissatisfaction. The complaints regarding vigilance and

corruption, forgery, cheating, misappropriation, favours, wilful negligence, reckless decision making, blatant violation of systems and procedures, irregularities and exercise of delegated powers can be lodged on our website

http://www.gailonline.com/final_site/onlineComplaints.html.

Corporate HR supervises the Online Grievance Redressal System for employees. The HR Manger in-charge must address the employee grievances registered within the stipulated period. with timely redressal not happening, the grievance case is escalated to the General Manager (GM) HR and in case of status quo, further escalation to Director (HR) is done. The employee can also further appeal in case of dissatisfaction with the received response. Our Customers can complain regarding the product quality by registering Service Request / Complaint / Indents 24 x 7 online through our webpage.

We have a Centralized Public Grievance Redress and Monitoring System (CPGRAMS) portal. Written complaints received from across all the work centres are uploaded, it is a Government of India Portal (Department of Administrative Reforms and Public Grievances) operated by us. The CPGRAMS portal is accessible to citizens for lodging their grievances and complaints online, which are received by the MoPNG.

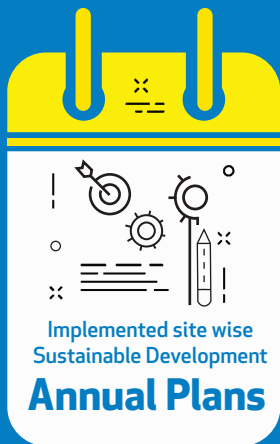
The following is the classification of the grievances G4-EN34, G4-LA16, G4-HR12, G4-SO11 received, redressed, and responded through this portal during the year 2016-17.



CHAPTER

03

Sustainability Strategy



On the Occasion Award of CMD Trophy to Winners of Best Quality Circle Projects



Sustainability Strategy

Natural gas has emerged as the clean fuel of 21st century. Gas sector has been witnessing very exciting and challenging times in last few years. The ever-expanding potential of Natural gas in diverse sectors of economy earns it an enhanced focus from policy makers. Government of India has initiated several policies towards energy security, including allowing 100% foreign direct investment (FDI) in segments such as natural gas, petroleum products and refineries. We are continuously adapting to the constant change and are committed to play our part to achieve a more sustainable energy mix.

To boost the development of the economy, the previously isolated region of east India is getting linked through pipelines under Urja Ganga project. In this project, a 2,540 km Jagdishpur – Haldia & Bokaro – Dhamra Natural Gas Pipeline Project (JHBDPL). We are aiming to create an environment where millions of Indians will swiftly improve their living standards by adopting natural gas. We have taken substantial efforts to ensure availability of affordable Natural gas for consumption by the entire nation.



Our Strategy



As a leading integrated natural gas company and India's youngest Maharatna Central Public Sector Enterprise, we look beyond our energy business to create a better tomorrow. Internally, through our Sustainability Aspirations 2020 we aim to reduce the impact of our operations on environment and society. We have initiated site wise comprehensive Sustainable Development Annual Plans which will help in achieving our Sustainability Aspirations 2020 targets. Further, we have also taken up responsible and strategic initiatives and also made investments towards renewables such as wind and solar. Our Roof Top Solar Captive power project at Pata is under execution. The total yearly power production is about 7.5 Million KWh.

Our existing presence in petrochemical business and future growth prospects

has helped us utilising all components of natural gas. The polymer produced from our petrochemical plants has indirectly helped reduce deforestation. To become a significant petrochemical player in Asian market, we aim to develop sustainable export capability. The first step in this direction was taken this year by exporting 14000 MT polymers during the year. Further details are discussed in business profitability chapter.

To address national and global sustainability challenges, we collaborated with industry leaders, associations, and peers such as TERI, CII, GRI, UNGC, FICCI and CDP among others to use their expertise knowledge for the common goal. During the year we also conducted workshops in collaboration with organizations such as GRI Focal Point India, TERI, GCNI and CDP.





Our Progress on Aspirations 2020

GAIL declared its Sustainability Aspirations 2020 in the year 2012 considering the then prevalent business scenario. The strategy for future growth at that point of time was considered. Accordingly the Sustainability Aspirations were taken for the aspects of GHG Emission intensity, Specific energy consumption, water consumption intensity, waste water recycling and sustainability

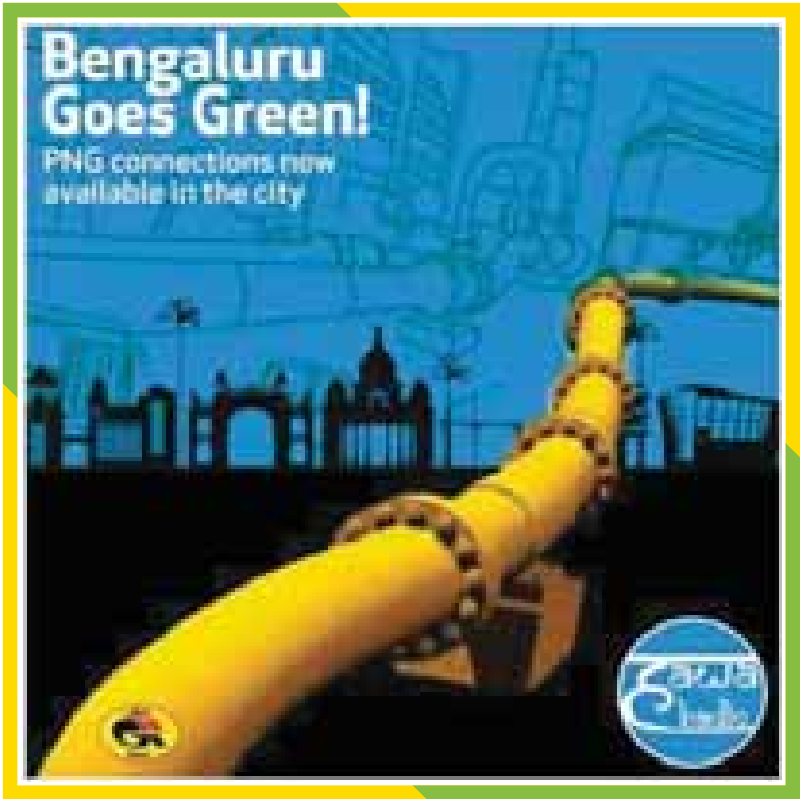
awareness amongst every employee. The performance on Sustainability Aspirations have since then been reported till FY 15-16.

The Hydrocarbon industry worldwide has undergone sea change during the past couple of years. Also, our two main production plants at Pata and Vijaipur have undergone major expansion almost doubling our petrochemical production capacities. These Plants have adopted state-of-art technologies and are under stabilization. Also, Global & National Aspirations in the form of

Sustainable Development Goals (SDGs) Agenda 2030 has gained momentum in the recent years. In order to disclose true performance on sustainability parameters, and continue reporting on the original Sustainability Aspirations, the company has decided to resume reporting on the performance after revisiting the Aspirations in near future. GAIL in the meantime intends to continue its efforts to ensure robust governance and monitoring mechanism for continued improvement in Sustainability performance.



The MoU on "Climate Change Risks: Preparedness for Oil and Gas Sector" was signed in New Delhi in the presence of Shri Dharmendra Pradhan, Hon'ble Minister of State (I/C), Petroleum & Natural Gas and K.D. Tripathi, Secretary, M/o Petroleum & Natural Gas and representatives from oil and gas industry.



Stakeholder Engagement and Materiality



Glimpses of GAIL India stall at the CSR Fair, 2017 organized by Dept. of Public Enterprises, Ministry of Heavy Industries and Public Enterprises



Stakeholder Engagement and Materiality

Deep and sustained engagement with our stakeholders gives us insight into their perspectives on our economic, environmental, and social performance. It makes us conversant with the topics that are most material to them. Also, it serves as an opportunity to share information about our organisation’s strategy and practices with them. It helps us develop a trust-based and transparent relationship with our stakeholders. These regular engagements help us become sensitized and responsive to their needs while making us better informed for prompt action. We have a structured process in place to identify our key stakeholders and obtain their feedback on material aspects. Effectively addressing the key material topics raised by the stakeholders helps us further in building a sustainable organisation.



Our Approach



We at GAIL have taken a gradual and structured approach towards materiality assessment and stakeholder engagement, which has evolved over the years. This has led to identification of material topics most important to our stakeholders and our operations. This has facilitated in making cognizance of the feedback and thereby making our strategies to improve our sustainability performance. Our endeavour is to cover broad range of material topics and engage across stakeholder groups. Our engagement is about integrating the expectations and interests of our stakeholders into our governance, organizational and management strategy. Stakeholder engagement in our company is a regular ongoing activity, which provides inputs for effective decision making. G4-DMA, G4-24, G4-25, G4-26, G4-27





Stakeholder Engagement Process

- Creating an exhaustive list of stakeholder's across value chain
- Classification of stakeholders (internal & external)
- Prioritisation of stakeholders
- selection of key stakeholders for Stakeholder Engagement
- Formulating questionnaires for the identified stakeholder groups
- Liaising with the departments to arrange stakeholder meetings
- Site-visits to engage with the stakeholders
- Understanding perspective, concerns of stakeholders and taking their suggestions for GAIL's sustainability initiative improvement



- Identifying the universal set of material topics relevant to GAIL and its stakeholders
- Interaction with important internal stakeholders (HoDs) to finalise the list of relevant material topics
- Shortlisting the most important 20 material topics for Stakeholder Engagement
- Documenting stakeholder views through questionnaires and interviews
- Analysing responses to determine the key material aspects for each stakeholder group
- Developing the materiality matrix based on the key material aspects determined by the stakeholder interactions

Stakeholder Engagement Process



GAIL Stall at CSR Fair organised by DPE

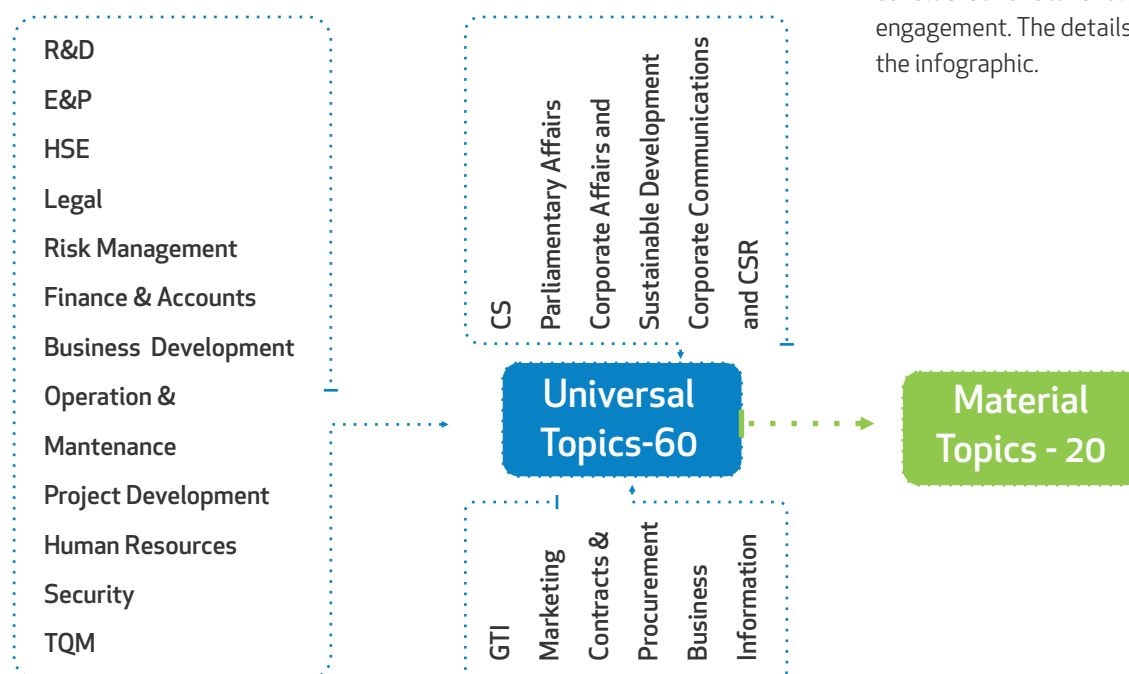
Stakeholder Mapping

The stakeholder engagement and materiality determination process starts by identification of the key stakeholders. The key stakeholders are essentially identified internally in consultation with various departments and their heads.

Identifying Material Topics

The universal set of relevant material topics were identified enlisting approximately 60 topics. Our primary sources include business performance & strategy, previous years' material topics, risk management

approach, and other internal documents for identification of material topics. We also reviewed various secondary sources such as peer material topics, GRI aspects, media reports, press releases, regulatory bodies, and government missions. The above universal topics were narrowed down to 20 through internal deliberations with department heads and relevant internal stakeholders. The 20 issues identified internally were considered for stakeholder engagement. The details are given in the infographic.



Selection of 20 most relevant material topics from universal issues

Stakeholder Engagement

Stakeholder engagement is all about identification, assessment, and impact of stakeholders' opinion. Primary stakeholders are those, who are directly affected or can affect the actions of our company. While secondary stakeholders are individuals or groups that have indirect influence on our activities.

Apart from the regular stakeholder

engagement, a dedicated exercise was conducted in financial year 2016-17 for reporting purpose. The key stakeholders were divided into 5 stakeholder groups across 10 locations including Corporate office and Noida office. The 5 stakeholder groups included employees, customers, NGO & community, suppliers, and contractors. Questionnaires were developed based upon the identified 20 issues. All the stakeholders responded on the top 20 key material topics rating them as high,

medium, or low. The stakeholders were given equal importance and the scores were normalised by taking the weighted average for each stakeholder group irrespective of the total number of participants. For each set of stakeholders, we arrived at a list of prioritised focus areas based on normalised scores. After analysing the prioritised focus areas across all stakeholder groups, the final list of material topics was identified. The mode of engagement with



stakeholders included questionnaire surveys, online survey, focus group discussions, and in-person interactions.

We used both qualitative and quantitative techniques for data collection. Approximately 800 respondents rated the material topics on high, medium, or low significance scale. These interactions assisted in developing a rich repository of

qualitative and quantitative data which was used to infer the most material topics.

Collating and Analysing Responses

Our stakeholder engagement model is based on proactive and interactive

approach to communicate effectively with our stakeholders to forge a shared common vision. The feedback received from various stakeholders both online and offline were analysed to get the key material topics for each stakeholder group. Enlisted below are the key material topics which were determined based on the feedbacks from each stakeholder group:

Stakeholder	Importance of the Stakeholder Group	Engagement Teams	Frequency of Engagement	Mode of Engagement	Key initiatives taken to address concerns, perceptions, advice & suggestions
Employees	Our employees as our greatest asset and we engage with them on a continual basis.	Human Resource Department, Human Resource – Employee Relations & Policy, Corporate Operations & Maintenance, Health Safety & Environment Department, Corporate Sustainability Department	Annual, Quarterly, Monthly, Daily. Need based	Satisfaction surveys, Grievance Redressal, Suggestion schemes, CMD open house, Sustainability Survey, Various committees, Emails, Journals, Meetings with employee associations and unions; Various Events including GAIL Day celebration, Sports Meet, Health Campaign etc.	a) Communication on GAIL’s business goals, values and principles b) Action planning on major projects c) Implementation of best practices d) Facilitating learning and developing e) Track key performance indicators and action plans f) Understand and address concerns g) Idea generation, sharing and learning
Suppliers	GAIL’s primary business is of gas transmission which makes it important to engage with the suppliers on a continual basis. Transparent relationship with supplier helps to reduce risks and discover new opportunities. Also, this helps us to improve our supply chain and planning.	Contracts & Procurement Department, Projects Department	Annual, Quarterly, Monthly, need based	Supplier meet, Emails, meetings, Samadhan, Samvaad	a) Integrity Pact Mechanism b) Pre-tender & Pre-Bid Meeting c) Conciliation through Settlement Advisory Committee d) Reverse auction e) Bill watch system f) File Movement System g) e-Tendering





Stakeholder	Importance of the Stakeholder Group	Engagement Teams	Frequency of Engagement	Mode of Engagement	Key initiatives taken to address concerns, perceptions, advice & suggestions
C u s t o m e r s	Customers are an important ally in our endeavour towards excellence. We continuously work with them to improve product and service quality.	Marketing Department, Total Quality Management Department	Annual, Quarterly, Need based	Customer Interactive Meets, Customer feedback	a) Customer Suggestion Box: To understand customer requirements, address operational concerns & to get feedback on new product development b) Customer Satisfaction Index: To understand their satisfaction levels c) Customer Ledger: For transparent transaction
C o m m u n i t i e s	Local communities provide us the social license to operate, and hence are central to our growth. We have also developed a CSR policy for effective development of the community.	Corporate Social Responsibility Department.	Annual, Quarterly, Monthly, Need-based.	Community Meetings, Project Meetings, Annual Reviews, Samvaad	a) Executing Social Responsibility initiatives /projects. b) Understanding and addressing their concerns on critical incidents
G o v e r n m e n t & R e g u l a t o r s	Government and other regulatory bodies play a very important role in influencing how businesses operate throughout the world. This is in form of taxes, regulatory and other policies, creating a level playing field for businesses, providing access to capital and other related functions. GAIL regards compliance to all laws and regulations as a high priority.	Regulatory Affairs Department, Law Department, Corporate Planning Department, Liaison & Parliamentary Affairs Department, Company Secretariat.	Annual, Quarterly, Need Based	MoUs, QPR, Open-House sessions, Hearings and other Meetings, written views/comments to PNGRB on various regulatory matters, as required by PNGRB.	a) Relationship building b) Performance appraisal through MoUs c) Submission of progress reports d) Discussions on major investment plans





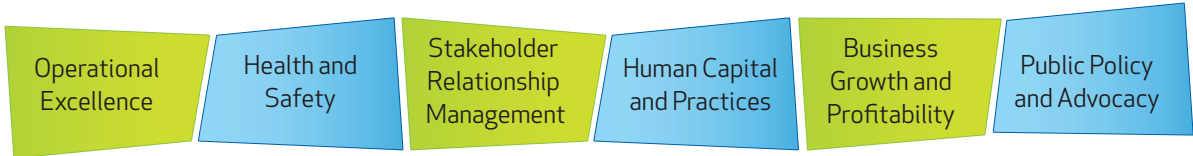
Stakeholder	Importance of the Stakeholder Group	Engagement Teams	Frequency of Engagement	Mode of Engagement	Key initiatives taken to address concerns, perceptions, advice & suggestions
N G O s	GAIL interfaces with the local communities through NGOs. Hence, NGOs are critical in forging strong relationships with communities in GAIL's operational areas	Corporate Social Responsibility Department, Corporate Sustainability Department	Annual, Quarterly, Monthly, Need-based.	Community Meetings, Project Meetings, Annual Reviews, Samvaad	a) Executing Social Responsibility initiatives /projects.
Contract Employees	Our contractors are as important to us as our regular employees, and at GAIL we ensure that their voice is heard. We comply with all the laws of the land applicable to contract employees in terms of wages, working conditions, health & safety etc	Human Resource Department, Corporate Operations & Maintenance, Health Safety & Environment Department, Corporate Sustainability Department	Annual, Quarterly, Monthly, Daily, Need-based.	Plant-level committees, meetings with employee associations and unions; Various Events including GAIL Day celebration, Sports Meet, Health Campaign etc.	a) Proper training and communication on health & safety issues b) Facilitating proper on the job trainings c) Community engagement programmes
Investors/ Shareholders	Investors play primary role in a company by funding the operations of the company and thus receiving "part ownership". By this virtue they become one of the most important stakeholders.	For Institutional Investors & Analysts: Finance & Accounts For Retail Investors: Company Secretariat	Annual, Quarterly, Need-based.	Analyst Meet, Annual General Meet, Conference Call, Website hosting of financial information	a) Clearly communicating the company's values, business plan, strategy, risks, growth prospects, etc. b) Highlight the company's performance vis-à-vis previous periods c) Communicate to the investing community, what makes the company unique for the investor to invest their money d) Address the concerns of investors with respect to the future challenges

Supply Chain Management has not been taken as an individual material aspect this year as per the responses of the stakeholder engagement, although the sub aspects of it have been included in chapters Business Growth & Profitability and Stakeholder Relationship Management.

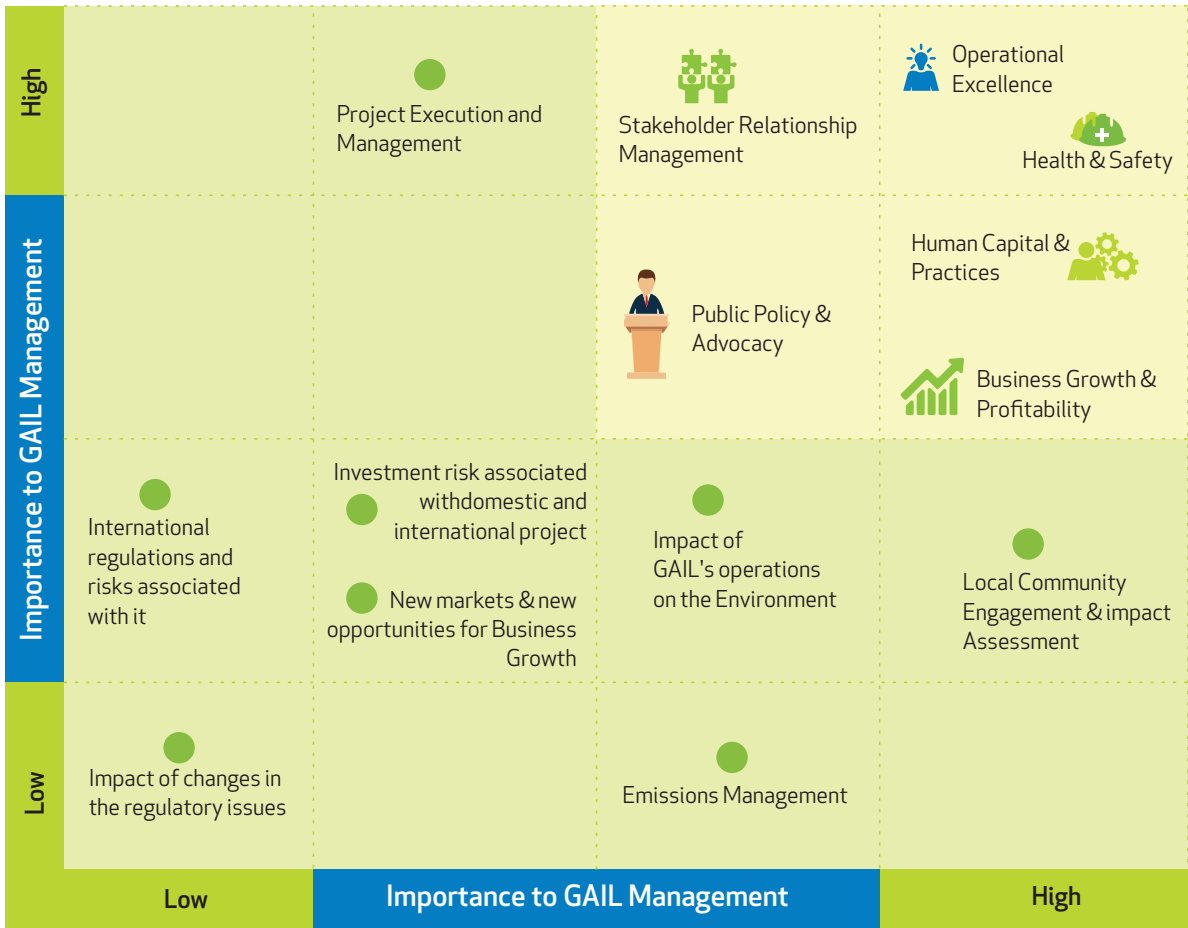


Materiality Matrix

The materiality matrix is the result of an extensive stakeholder engagement process. The material topics identified through this exercise are:



The materiality matrix determined is presented below:



Some Material Topics are clubbed for better representation in matrix

In this report, we have highlighted our approach towards the identified material topics and company specific aspects in detail. Each material topic has been discussed in detail in the subsequent chapters. The mapping of the final high material topics with stakeholders is given in the table belowG4-19, G4-20, G4-21





Material Aspects	Sub-aspects	Boundary	Major Stakeholders
Operational Excellence	Material	Within GAIL	Customers
	Energy		Employees
	Water		Suppliers
	Biodiversity		Contractors
	Emission		
	Effluents & Waste		
	Asset Productivity*		
	Environmental investments		
	Grievance mechanism for impact on society		
	Transport		
	Overall		
	Environmental Grievance mechanism		
Health & Safety	Occupation Health and Safety	Within & Beyond GAIL	Employees
	Customer Health and Safety		Suppliers
	Asset Integrity and		Contractors
	process safety		NGOs & Communities
Stakeholder Relationship Management	Procurement Practices	Within & Beyond GAIL	Customers
	Supplier Environmental Assessment		Suppliers
	Supplier Assessment for impact on society		Contractors
	Supplier Human Rights Assessment		NGOs & Communities
	Supplier Assessment for Labour Practices		
	Indigenous Rights		
	Marketing and communication		
	Product and Service labelling		
	Product and Services		
	Local community		
	Procurement Practices		
	Adequacy of transparent communication*		





Material Aspects	Sub-aspects	Boundary	Major Stakeholders
Business Growth & Profitability	Economic	Within & Beyond GAIL	Customers
	Performance		Employees
	Market presence		Suppliers
	Indirect economic impacts		Contractors
	New diversification and seeking new opportunities*		NGOs & Communities
Public Policy & Advocacy	Anti-competitive behaviour	Within & Beyond GAIL	Customers
	Anti-corruption		Employees
	Public policy		Contractors
	Compliance		NGOs & Communities
Human Capital and Practices	Employment	Within GAIL	
	Labour/Management		
	Relations		
	Training & Education		
	Diversity		
	Employment and labour practices		
	Human Rights Investment		
	Non-discrimination		
	Human rights grievance mechanism		
	Assessment		
	Freedom of Association and Collective Bargaining		
	Forced or compulsory labour		
	Child Labour		
	Equal Remuneration for men & women		
	Labour Practices Grievance Mechanism		
	Security Practices		

* These aspects are not included under the GRI G4 aspects but have been included in the report to provide completeness to the material issues identified.



CHAPTER
05

Operational Excellence



In Renewable Energy Revenue
due to Wind Energy



Cashless Transaction
at GAIL Township





Operational Excellence

GAIL plays a vital role in the social and economic development of the country while substantially contributing towards nation's energy security with a cleaner environmental friendly fuel i.e. natural gas. It has been our consistent endeavour to provide the customer with an efficient and timely response, quality product and services. It is achieved by combining our experienced team of employees that lie at the core of our operations, Project management skills, and effective O&M capabilities with responsible consideration for all our stakeholders and the environment.



We constantly strive to achieve Sustainable Growth of our organization through focus on Performance, Health and Perception (PHP) aspects, stick to cardinal rules framed in order to achieve excellence in different aspect of PHP. The 5 pillar approach of ABCDE: Attitude, Behavior, Commitment, Discipline, Efficiency, we believe is an enabler for change and we strive to build excellence in our systems, procedure, practices, policies and strategies. We believe in raising the bars for ourselves, every day. In line with the national priorities of developing a national gas grid, we are committed to develop our gas infrastructure throughout the country for efficient delivery of gas to end consumers.

As we envisage GAIL to make rapid strides in terms of growth, our firm intent on responsible growth will help us to stand apart. The concept of EIL- Efficiency, Innovation and Learning will help us achieve the objective. Your company has also taken a "Delta" initiative to encourage employees to choose any area for improvement in Process, Plant & People (Self / Others). This will initiate a chain of continuous improvement in the process and behavior of people. With this positive outlook, we aim to tread towards and go beyond the realms of traditional success.

Director (Projects)



Shri M V Ravi Someswarudu, OIC GAIL Pata watering to sapling on the occasion of World Environment Day

Our Approach



Effective monitoring of our operations and maintenance of pipelines and plants helps ensure a reliable and operationally safe system, providing not only uninterrupted supply of gas to consumers, but also maximizing the throughput. GAIL's emphasis is not only on maximizing production and sale of natural gas but also to achieve this with least resource consumption. Every effort is focused on energy-efficient operation of the plants, machinery





and processes. In addition to strengthening our core, we remain committed to achieving growth that truly encapsulates the essence of sustainability by achieving our social and environmental commitments. While expanding our operations across the Nation, we understand our relationship with the communities that are critical to our nature of operations. Our policy for Operations and Maintenance resonates our tenet of ensuring highest level of operability and availability. We aim at achieving the maximum productivity of our assets by regular, maintenance, monitoring controlling & reporting. Individual roles and responsibilities are defined across the operational systems and are assessed from time to time for their efficient functioning. G4-DMA

Leadership Responsibility

We at GAIL believe that robust leadership is one of the fundamental factors to steer successful implementation of systems to achieve operational excellence. At GAIL employees are at the core of the organization's principle and ideology and these principles are adhered to from the leadership level to the field levels.

Every project in GAIL is steered by Head of the Departments within the existing systems and process of GAIL. Every project / innovation has its set milestones, performance monitoring tools and reporting formats and frameworks, thus enabling regular monitoring and timely execution of the project as per the design.

Adequate systems and processes in GAIL are already established for empowering and motivating employees. Consequently, every employee in GAIL has set responsibilities and targets to

perform and excel in his or her own area of impact that include Key Performance indicators aligned with achieving operational excellence and sustainable development goals. At GAIL, we stimulate the employees to accept and acknowledge their set of responsibilities and deliverables with the required quality parameters while ensuring the adherence to standard operating procedures (SOPs).

O&M Objectives

GAIL's approach for achieving its vision for world-class performance forms the core of our O&M objectives. Our O&M policy determines the objectives, targets and actions for asset maintenance, their life cycle assessment & review for refurbishment & replacement. Our O&M objectives cover the following areas:

Integrated Management Systems

Operational excellence is driven by numerous components such as the adoption of best-in-class technologies,

optimized processes, resource conservation and waste reduction among others.

The components of operational excellence lead to enhanced efficient asset performance which in turn leads to profit maximization. To achieve these objectives manufacturing of quality product and uninterrupted operations is essential. Various management systems are integrated and embedded at GAIL to ensure seamless functioning of operations. These management systems help analyzing system gaps and determining the associated risks and threats.

The integrated management system at GAIL include Pipeline Integrity Management System; Quality Management System, Energy Management System, and Environment Management System. The various sites of GAIL also comply to ISO 9001, ISO 14001, and OHSAS 18001 certifications. The efficacy of these is reviewed through periodic internal & external audits, surveillance audits, certifications, and recertification through external Certification agencies.





Components of Operation Excellence



Asset Integrity & Productivity and Service Reliability

Our policy for asset integrity management recapitulates our view to determine the objectives, targets, and actions. It also covers the policy of asset maintenance by predictive, preventive schedules, followed by turnaround schedules. G4-DMA

We at GAIL ensure the safety of our pipelines from the initial phase. The pipelines and their supporting infrastructure is designed in accordance with the national and international standards such as the ASME, OISD and PNGRB. We also observe guidelines used by the API, BS, Canadian Standards, DIN, NACE and NFPA. GAIL's Central Pipeline Integrity Management System (CPIMS) maintains the integrity of the extensive network of gas pipelines, which is done by showing the status derived by recording threats, risks, possibility of failure and compliance to statutory regulations through GIS data and temporal data consolidation. This results in reduction of risk of pipeline failure, insurance cost and the downtime. Accordingly, the life of the pipeline is also increased by initiating preventive



Dr. Ashutosh Karnatak, Director (Projects) receiving Achievement Award for Public Officer, during 9th Vishwakarma Awards





Effective Project Management

GAIL is executing INR 20,000 crore worth of projects in which 4,000 km of pipelines will be laid in the next 30 months boost India's pipeline infrastructure. These include the Vijaipur to Phulpur pipeline, Jagdishpur-Haldia-Bokaro-Dhamra pipeline (JHBDPL) and Kochi-Koottanad-Mangaluru-Bengaluru Pipeline (KKMBL) project. The Vijaipur to Phulpur pipeline shall provide the gas feed to the ongoing prestigious 2655 Km long JHBDPL project of GAIL, also known as the 'Pradhan Mantri Urja Ganga' project, inaugurated by Hon'ble Prime Minister of India in July 2015.

The JHBDPL is aRs 13,000 crore project. Work has started on the Kochi-Mangaluru pipeline. GAIL is also refurbishing its old pipelines in Gujarat, which are 40 years old, and also in the Cauvery and Krishna Godavari basins. The focus is on expanding last-mile connectivity to houses and networks in cities.

1. Timely Completion

- Ensuring Stakeholder Inclusivity in RoU Compensation: Appropriate Compensation package is identified in consultation with State Administration and the affected farmers / land owners, and the RoU Compensation determined by Competent Authority.
- Permanent Land acquisition through Direct Negotiation: To reduce and appropriately address the land owner grievance as well as to ensure timely execution, permanent lands & associated facilities for Pipeline Stations are acquired through direct negotiation wherever required.
- Working with Authorities: Even before the initiation of the project we initiate collaborative working with various authorities to ensure smooth project execution.
- Standardization: Standardization of various sections of tender documents is carried out and while doing the same, feedback from all the concerned stakeholders is also obtained. Also, bidder's queries in the past related to less clarity / discrepancies / missing information etc. are also considered during the standardization exercise. Our achievement of High level of clarity in Scope of Work gets reflected in the fact that execution of extra items & deviations account for less than 2 – 3% of the award value on consistent basis.
- Expeditious execution of Last Mile Connectivity's (LMC): Last Mile connectivity's are the revenue source for the organization and utmost care is taken to ensure that LMCs are completed on schedule. Over the last 4-5 years, the organization has been able to complete 35 – 45 LMC's in each year. This consistency in LMC project completion is achieved through maintaining Inventory of line pipes / line materials as well as through various Annual rate Contracts
- Incorporation of Lessons learnt: Through Checklist systems, incorporation of lessons learnt in upcoming tenders is ensured.

2. Monitoring & Controlling Practices:

- Periodic Review Meetings: Every fortnight, an ED level meeting and a GM level steering committee meeting on a weekly basis is conducted with defined Agenda. In addition, the Project manager monitors on daily basis.
- Monitoring through Milestones: Constraints - Exceptions: The monitoring is carried out on Milestone basis system. Responsibility to resolve the issues / constraints & the periodicity for resolution is fixed. Any constraint pending for more than 15 days is intimated to management through exception reporting.
- PMCC ((Planning, Monitoring, and Controlling Cell) are established at each site to monitor progress of various initiatives / activities w.r.t above mentioned systems & procedures and periodically reporting the progress / exceptions to management.

3. Resource Management:

- Right man at right place: Based on the employee skill set and Strengths / Weaknesses / Motivators /





Aspirations, job allocation is done.

- **Expediting Cell:** For better inventory planning to ensure timely availability of required material, a separate working group of Expediting Cell has been created that coordinates with various stakeholders involved such as PMC, Vendor, Sub-vendors etc.
- **Employee Motivation:** High productivity requires high motivational level of executives. In order to achieve this, resolution of personal concerns of the executives is given utmost priority. In fact, executives are periodically engaged to amicably address their grievances and concerns.
- **Training and Development:** Project is a culture in itself and the executives involved in Projects need to understand and adopt this culture to ensure project success. All the Project executives are provided with relevant certified project management courses. Trainings at GTI, Field trips to gain technical competencies, and knowledge sharing sessions.

4. Stakeholder Management:

- **SAMADHAN Forum:** Through a structured online Grievance redressal forum of Samadhan, Stakeholders' issues are amicably resolved.
- **Public Awareness Campaign:** In order to develop awareness among the public about the benefits of Pipelines and to clear their misplaced notions about environmental / safety aspects of Pipelines, public awareness campaign through media is being carried out in the states where pipelines are under execution / going to be taken up. For this, services of local media & local prominent personalities are utilized.
- **Meetings with People / People's representatives / Administration & CSR Activities:** Support of people / people's representatives / Administration enroute the pipeline are one of the key factors in ensuring project success. Hence, regular meetings are held with People and people's representatives to identify the CSR needs and implementing them subsequently.
- **Fund Planning of Contractors:** On monthly basis, fund planning of contractors are discussed with clear focus on how much fund is required by the contractor for next month, for what activities the fund is required and how they will generate the funds. If required, payments against pending bills at GAIL are expedited to take care of the fund crisis of Contractors.
- **Periodic meetings with key Stakeholders:** periodic meetings with key Stakeholders are held to identify their grievances / suggestions for further improvement and necessary corrective actions (change in practices, modifications in tender documents etc.) are taken.
- **Timely replies to Ministry / Parliamentary / RTI queries:** 100% compliance with respect to submission on replies to queries of key stakeholders.
- **Focus on Order Closures & retentions:** Fortnightly structured meetings, Order Closures & retentions reviewed by ED / GM and prompt actions are taken to settle the pending cases.

5. Environmental Sustainability:

- **Solar Power Source for Pipeline Stations:** Energy requirement of all the Pipeline Stations are met through Solar Power Source instead of conventional grid power / CCVT / TEG.
- **Rain Water Harvesting:** All the Compressor Stations, Pipeline Stations, Office, Regional Gas Management Centre (RGMC). RGMC Buildings are provided with Rain water harvesting pits to improve the natural water table.
- **Energy Efficient Building (Green Building):** In order to reduce the energy requirements of the control room buildings in pipeline stations and to ensure quicker construction, a design for Energy Efficient building has been developed with help of IIT, Delhi and the same is about to be implemented. Further all the RGMC & Office Buildings under construction are in line with GRIHA norms for green buildings.



- Pipeline Internal Coating: Internal Pipeline coating is carried out in pipelines to reduce the frictional losses and thereby additional energy requirement on account of compression are avoided.
- Phase-wise pressure reduction: To meet the low pressure requirements of customers, phase wise pressure reduction is carried out and there by requirement of heaters to avoid sub-zero temperatures at customer ends are avoided.
- Development of Green Belt: across our installations and plants

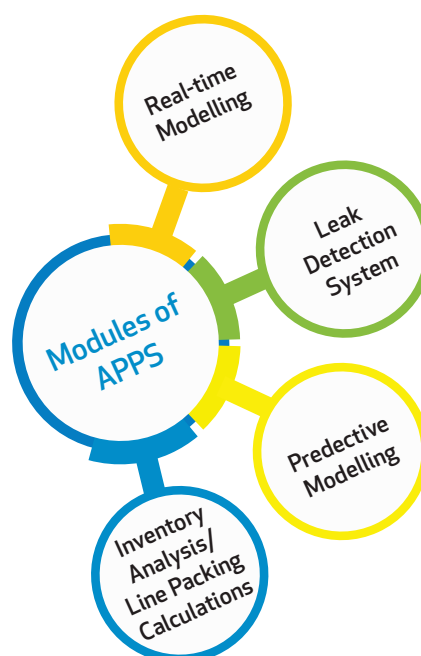
maintenance based on data collected and analysed at appropriate time.

Asset performance is ensured by review of the risk assessment and prioritization of the risks identified based on the collected data. The major focus is on the data which is collected for diagnosing threats, FFP (Fitness for Purpose) assessment and corrosion growth so that the mitigation measures can be sorted out. Pipeline design and standardized integrity assessment processes are also stored on the system and seamlessly made available to relevant and authorized users across operations.

NG and LPG pipelines are monitored through Application Software (APPS) in a phased manner. The tool also provides operation and planning tools for safe, reliable, optimum and economic operation of the pipeline networks.

For the creation of systems and processes for managing the integrity of all our owned and operated pipelines we have a Central Integrity Management Group(CIMG) within the Corporate O&M Department at Noida and to formulate the integrity management at regional level we have Regional Integrity Management Groups (RIMG), having the major function of identifying and effectively managing all the potential threats to pipeline

integrity and to strategize, identify, monitor, control, audit and demonstrate improvement on risk prevention/mitigation of each hazard.



Monitoring and Managing Pipeline RoU (Right of Use)

Encroachments in pipeline ROU are potential source of threat to the safety & integrity of the pipeline due to increase activities of inhabitants and consequences. It is observed that a significant number of encroachments have come up over a period of time in GAIL RoU due to rapid urbanization and

expansion of cities & towns in various parts of the country.

To protect the pipeline from any unintentional damage and subsequent leading to unsafe condition, action plan for eviction of encroachment based on categorization, type of encroachment etc. and its prioritization for removal has been developed keeping in view of the provisions of P&MP Act and other extant regulations & relevant standards. Web based portal has also been developed for monitoring ROU encroachment across GAIL.

Till the removal of encroachment, a system has been devised for disseminating awareness to the encroacher/ general public living in and around pipeline ROU about the hazards of encroachment on a high pressure gas/ LPG pipeline.

After notice of any encroachment, respective maintenance base is taking up with the encroacher to remove encroachment, failing which, inform to District administration for necessary support, followed by legal action, if required. Further, Chief Secretary of States are also requested from time to time by GAIL soliciting necessary help & support in this matter.

Adopting the above methodology for dealing ROU encroachment, there is reduction of pipeline ROU encroachments by about 35% during about last one & half years period





Monitoring and Managing Pipeline Right of Use

Encroachment Policy:

With increase in activities of inhabitants and its subsequent consequences, encroachments in pipeline ROU are potential source of threat to the safety & integrity of the pipeline. It is observed that a significant number of encroachments have come up over a period of time in GAIL RoU. After analysing the data collected from various sites on pipeline encroachment, it is observed that some encroachments exist since GAIL take-over of pipeline/since laying and some have come up in due course.

GAIL Sahyogi Scheme:

GAIL Sahyogi Scheme is an effort towards improving engagement with villagers/farmers/stakeholders/general public and to create awareness about pipeline safety & security among nearby population/villagers along the pipeline. They will report any unwanted activities such as excavation, encroachment, washout, exposure, drilling, boring, leakage (if any), construction in or nearby pipeline ROU and attempt of any pilferage etc. to nearby

maintenance base of GAIL.

Sahyogis get suitable incentive/reward during their association with GAIL. Currently this scheme is being implemented at four GAIL locations on pilot basis and based on the outcome it will be implemented at other locations also.

In this Scheme, one or more person identified by GAIL in villages/towns/cities/ROU land owner etc., who are living in the vicinity of GAIL pipeline route and keep the vigil on GAIL's asset & report/stop any activities which are detrimental to pipeline safety and inform to GAIL. The scheme is implemented by respective regional pipeline headquarter by engaging an agency for extending services for management of GAIL Sahyogi Scheme.

Foot Patrolling along ROU of Pipelines

One of the important O&M activities for monitoring the condition of pipelines is foot patrolling along the ROU of pipelines. The frequency of foot patrolling is being done on fortnightly/monthly/quarterly basis by Security Guards. In addition,

GAIL engineers are also doing foot patrolling along the pipelines once in a year. The foot patrolling with gas detector adds value to the exercise. It is pertinent to mention that, the cross country pipelines crosses through difficult terrains like canals, ponds, mushy fields etc. which cannot be accessed especially during the monsoon seasons. Remote detection allows the user to safely survey difficult to reach areas. This is time saving method of detection of leakage which leads to productivity gains, reduced operation and maintenance costs and a safer survey.

ROU Monitoring through Satellite Imaging

In order to establish the efficacy of the latest pipeline monitoring technology, namely "High resolution low orbit satellite imaging", a pilot project on remote surveillance of pipeline ROU through satellite was taken up recently for a stretch of 610 Km in DVPL pipeline by R&D department in collaboration with National Remote Sensing Centre (NRSC). The process of Satellite imaging helps marking new encroachments and washouts etc.



Glimpses of Pipeline Management activities



Our Commitment-

ZERO Areas for Operations & Maintenance

1. Zero Accidents/ Incidents
2. Zero deviation in implementing preventive/ predictive measures to curb corrosion
3. Zero Encroachments
4. Zero deviation in Statutory compliances
5. Zero deviation in compliances with Standard Operating Procedures (SOP)

Also for the health and integrity of the pipelines we have empanelled certified Subject Matter Experts (SMEs) of international repute. A system has been developed for carrying out root cause analysis of incidents through three tier investigation mechanism i.e. internal committee at first level, External Technical Consultant such as Engineers India Limited (EIL) at second level and through an internationally reputed independent agency at third level. To prevent the recurrence of any similar incident the recommendations of the three committees are integrated and corrective measures are identified.

Capacity Utilization

With our sustained efforts to provide best services to our customers, our transmission segment registered an increase of 9% growth in volumes over last fiscal year by clocking 100.4 MMSCMD. The following efforts have been taken to increase the Natural Gas pipeline utilization:

Stringent measures have been taken to ensure quality of source gas / LPG to customers and regular monitoring of health of pipelines to maintain regular supply of gas.

Benchmarking Initiative

GAIL commissioned a detailed benchmarking study of O&M activities of NG Transmission, Gas Processing Units, Petrochemicals, Contracts and Procurements and Pipeline projects by an independent consultant of repute. The study gathered information across all areas, using as is surveys, peer data analysis and comparison. The objective of the project was to estimate GAIL's position compared to best in class companies globally, in order to identify initiatives that GAIL could implement, to stay ahead of the curve. The consultant has put in concerted effort to include best in class peers across geographies.

Efforts taken to increase the Natural Gas Pipeline Utilization

Long term RLNG tie-up with the fertilizer companies (Contracted quantity of 7.2 MMSCMD in FY 16-17).

Implementation of Power pooling scheme has increased RLNG off-take (4 MMSCMD in FY 2016-17).

GAIL has developed guidelines for providing faster execution of hooking up facility to CGD entities (approved 6 Hook-ups in FY 16-17).

GAIL completed 14 pipeline projects including Last mile connectivity of approximately 437 kms, to harness the commercial utilization of various pipeline networks in the states of Karnataka, Gujarat, Goa, Haryana, Rajasthan, Maharashtra and Punjab. In the FY 2016-17, 23 new LMCs (with maximum flow of 2.7 MMSCMD) were rolled out.

Swapped KG-D6 volumes (0.82 MMSCMD) with RLNG volume for supplying gas to BGL and Pata.

GAIL has developed sales/transmission contracts specifically to meet the requirements of small customers.

GAIL's transmission is expected to increase in FY 2017-18 with increased output of Reliance's CBM gas at Phulpur to the tune of 0.5-0.7 MMSCMD and ONGC's S1 gas by approx. 0.5 MMSCMD.

GAIL has developed guidelines for providing faster execution of hooking up facility to CGD entities (approved 6 Hook-ups in FY 16-17).

With the upcoming of Jagdishpur Haldia & Bokaro Dhamra pipeline (JHBDPL), the states of Uttar Pradesh, Bihar, Jharkhand, Odisha and West Bengal are getting connected with natural gas pipeline. CGD network along JHBDPL is also synchronised with JHBDPL in the cities of Varanasi, Bhubneshwar, Cuttack, Patna, Ranchi, Kolkata and Jamshedpur. This will further increase gas transmission as eastern region of the country which has been devoid of natural gas so far, shall get natural gas.

Customer friendly provisions in the gas transmission contracts to accommodate the requirement of small volume shippers. GAIL has also introduced has also introduced an Imbalance Management Services for shippers to manage the imbalances efficiently.





Compliance Management

We comply with all relevant legislation, laws, standards, codes, and internal policies. The awareness on compliance obligation is brought about through training, and legal advice. Our Legal Compliance Management System (LCMS) ensures compliance to all national and relevant international regulations and regulatory compliance requirements across various segments and includes SAP based internal & routine monitoring for continuity in compliance at all times. One of the integral parts of online LCMS is Periodic review and audit. Apart from LCMS the provision for manual auditing like internal/external audits through internal/external teams exists in GAIL for monitoring of legal and regulatory requirements. G4-DMA

Internal audits help in monitoring the compliance with the policies and procedures of the organization. The Board Level Audit Committee reviews and assesses the compliance level of projects. The Audit Committee also reviews established standards of business ethics and the procedure to be used for reporting violation of policies. The responsibility lies with the Heads of Departments to create systems and procedures to ensure compliance.

Technology Utilization

National Gas Management Centre (NGMC) encompasses management of entire GAIL's Gas trading, transportation and LPG transmission business with the availability of live data at centralized location for monitoring pipeline parameters, delivery conditions at all measure Customer terminals, gas reconciliation and accounting for entire gas business.

NGMC is linked to 10 Regional Gas Management Centre (RGMC). NGMC plays major role in monitoring the optimal distribution of gas from various sources ensuring optimal utilisation of GAIL's Pipelines and recovery of its components at Gas processing units.

Various important activities being carried out by NGMC for optimal utilisation of assets are:

- Day to day Natural Gas Demand Supply Management of HVJ-DVPL, DUPL-DPPL & VDPL-CJPL-DBPL pipeline networks in coordination with Suppliers / Shippers
- Transmission of LPG through JLPL/VSPL and monitoring pipeline parameters.
- Supply Natural Gas to all the consumers, without any interruption.
- Reporting of detailed MIS reports of daily receipt & sales of all types of gas for all consumers, LHC & polymer production etc.
- Monitoring of pipeline Hydraulics of HVJ-DVPL network through

LIVE SCADA for optimal utilisation of pipelines.

- Gas demand supply management, Liquid Hydrocarbon production & dispatches etc.
- Reconciliation of different types of gases in the system on daily, monthly and annual basis.
- Monitoring of liquid hydrocarbon stocks on daily basis through statistical analysis.
- MOU target monitoring for LHC production as well as NG transmission.
- As central nodal agency as per crisis management plan in case of any kind of emergency at O&M sites across GAIL.
- Ensuring no rich gas bypass from Plants except only plant tripping for short duration.

In addition to these we have developed centres of technical excellence across its value chain through the Network Management Centre (NMC), GAIL Polymer Technology Centre (GPTC) and GIGALINK (IT & ERP Data Centre).



Visit of Hon'ble MoPNG Minister Shri Dharmendra Pradhan to National Gas Management Centre



Towards Digital India- Digital Yatra of GAIL

We live in a technology driven world today. At GAIL, we understand the importance it holds in these times and utilize it our advantage to improve our systems and operations.

Digital Yatra is an initiative of GAIL management to become a world-class digital organisation and to institutionalize the concept of 'Digital Thinking' by implementation of strategic digital initiatives based on the global best practices. This will leverage the benefits of state-of-art analytics, Mobility and Collaboration Platforms to support business functions of GAIL including Plant Operations & Maintenance by integrating IT Systems with Plant and Pipeline Systems.

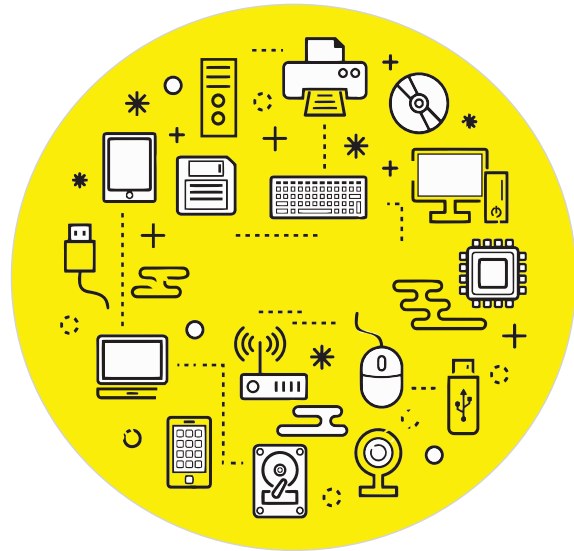
The objective of Digital Yatra is the Integration, Collaboration and Convergence of OT and IT to address the needs of mission critical services viz., to improve O&M efficiencies, maintenance optimization, enhanced decision making and sustainability.

Upgradation of security posture for Operational Technology (OT) Systems was identified as an important step to be undertaken before data integration between the OT and IT systems. GAIL has started the security and risk assessments of OT systems and its interfaces with IT systems. Expert agencies certified by, Indian Computer Emergency Response Team under the Ministry of Electronics and IT (CERT-IN), Government of India will conduct the assessments. This will be seamlessly followed by improvements of infrastructure, architectures, governance models and Standard Operating Procedures. Assessments and outcomes will comply with the global standards like IEC-62443 and NCIIPC.

GAIL has initiated the formulating of a comprehensive 'Digital Strategy'. Considering the dynamic and complex

business of Natural Gas, Liquid Hydrocarbons, Polymer and LPG manufacturing, Gas Sourcing, Marketing, Power Generation and more, there is immense opportunity to leverage the advances in digital technologies and advance analytics to build a scalable, flexible and an agile enterprise application platform that can proactively align itself to the ever changing business requirements, effective decision making and enable the business to stay ahead of competitors. The Digital Strategy aims to present an integrated view on large number of critical assets spread across multiple geographic locations consisting of Plants, Pipelines, ERP, IT and other business verticals of GAIL.

Some of the actions undertaken by GAIL towards the Digital Vision are the linking of Control Rooms of multiple Plants for joint and synchronised operations. Integration of critical and sensitive machines with the ERP systems are being done in phased manner for auto generation of Notification for condition based maintenance. Maintenance recording at field, status monitoring on Mobile dashboards are operative for maintenance needs of Pipelines. As IoT application, Analyser Data is linked with the online portal of Pollution Control Board. E-Log sheets for field operators on hand held devices are implemented. Gas billing to customers is automated by integrating the field sensors from Gas Metering Devices to the ERP systems for invoicing and on-line field reports. Product loading automation systems link the data of loading; weigh bridge sensors, Safety inspections with SAP-ERP. Real Time Pipeline Intrusion Detection Systems using OFC based acoustic sensing. On line vibration monitoring of critical rotary equipment



provide support to enhance Operation and Maintenance efficiencies.

With advance technological integration and State-of-Art monitoring systems are implemented for ensuring the safety, security and integrity of pipelines through proactive approach to prevent incidents. Digital interventions using IP based cameras at about 140 installations and mobile digital devices interfaced with GPS and sensors on field assets have produced excellent results for real time monitoring of Critical and Emergency operations and improved the response of 'Quick Response Teams'.

As line patrolling is extremely difficult for pipeline sections passing through forests, rivers, environmentally sensitive areas and other inaccessible areas, to patrol the pipeline to detect physical abnormal activity like encroachment or intrusion on the pipeline, we have hired one drone on a pilot basis for aerial surveillance of the HBJ pipeline in the Chambal Ravines in Madhya Pradesh. Based on the results, the company may decide to buy or hire more drones to monitor its 15,000-km pipeline network.

GAIL has also started using satellite surveillance to detect any breaches. GAIL is using live satellite monitoring of the pipelines and is now integrating



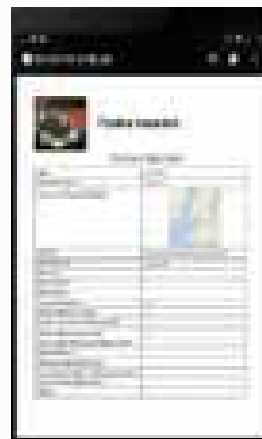
advance Unmanned Ariel Vehicle (UAV) with this system. GAIL did pilot project on satellite monitoring on its 610 km Dahej-Vijaipur pipeline.

Our SAP systems have been aligned for the successful migration of Regulatory and Statutory Compliance to the latest tax procedure. This was done as a requirement for Goods and Services Tax (GST) implementation across India. Enabling next generation unified communications & collaboration platform for all executives has been done for enhancing the employee collaboration. This is a revolutionary change in the existing communication model.

Information Security Management System (ISO 27001:2013) has been successfully implemented in our system. Currently a Security Operations Centre (SOC) has been established simultaneously with Advanced Persistent Threat mitigation system to disarm the new kinds of cyber-security risks. For enhancing the network connectivity and information security we have put in place a latest Private Cloud infrastructure and initiated several new projects.

Mobile app for pipeline information

GAIL has developed a mobile based application software which will facilitates accessibility of ready data based for pipeline parameters covering more than 40 attributes from any location through GSM mobile having GPRS. The attributes covers pipeline dia, length, thickness, design parameters, Source details, Crossing details, Statutory permission details, Integrity Survey Details, encroachments, defect repair history etc.



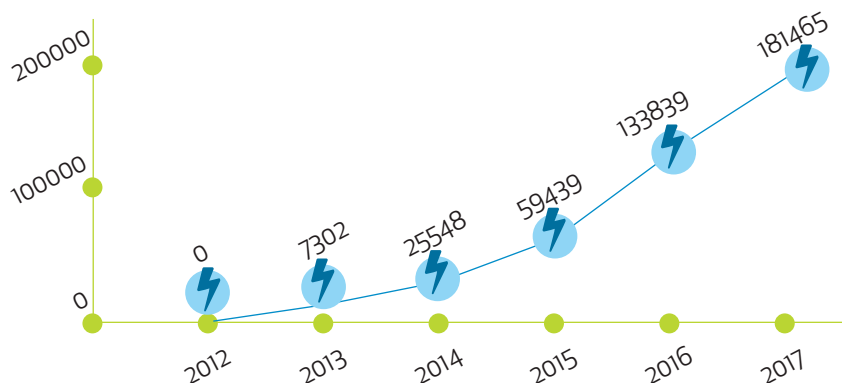
GAIL implemented an enterprise wide Electronic Document Management System (EDMS) in 2012 to move towards a "paper-light" office, providing an opportunity to reduce use of paper

which not only cuts down cost & time, but also reduces distribution / handling efforts and increases business productivity. The graph depicts the increased use of this system.

Cashless Transaction at GAIL Township

We have taken an initiative, in line with the **Digi-Dhan** campaign, to impart awareness on digital payment methods and cashless transactions to our employees, their families, contractual workers, CISF staff, the local vendors, and shopkeepers at all our locations with certain installations as the township at GAIL Vijaipur (M.P.) going completely Cashless under this initiative.

Electronic Data Management System





Energy Management

Energy is paramount to meet global challenges and opportunity. The 7th Sustainable Development Goal articulate about the necessity of access to energy for all, but still it is one of the leading contributors to climate change. Thus, we at GAIL target to reduce the use of energy and increase its efficiency. OG2

Integrated energy management system deployment with activities like energy consumption monitoring, periodic energy audits and corrective actions implementations and use of energy saving measures has been an organization wide plan for further reductions. We promote the adoption of progressive technologies and application of renewable energy resources. This year 65 Numbers of Pole mounted stand-alone LED solar lights has been installed at SV stations under NCR pipelines. This year an investment of around INR 47 lakhs have been made for replacement of conventional lights with LEDs and over INR 34 lakhs for replacement of old ACs with BEE 5 Star rated ACs at various locations.

There is a direct correlation with a beneficial impact on cost saving with respect to increased energy efficiency and decreased energy consumption. A few of our energy saving initiatives are enlisted:

Creation of Rich and lean gas corridor:

With an aim to reduce fuel consumption and maximize optimum efficiency and product recovery, GAIL undertook this Project.

Presently GAIL operates three pipelines from Hazira/Dahej to Vijaipur for transportation of natural gas from ONGC/PMT and imported RLNG. Enroute pipelines, GAIL is also operating Gas processing Plants i.e. Gandhar, Vaghodia, Vijaipur and Petrochemical Plant Pata which are getting feed gas from these pipelines. Earlier, HVJ was operating to cater the transportation of APM/PMT gas from Hazira and DVPL-I & DVPL-II were operating to cater the transportation of RLNG/KG-D6 gas. The injection from RLNG is being done to APM/PMT gas as and when required.

Post commissioning of OPAL, two variety of RLNG will be available at Dahej i.e. C2 semi rich gas and lean gas. Transporting and mixing of these two types of RLNG with APM gas will lead to reduction in recovery of value added product in Gas Processing Plant.

Accordingly, GAIL has taken up a project to optimally utilise available pipelines from Hazira/Dahej to Vijaipur to reduce the fuel consumption, maximise the recovery product recovery and optimum efficiency of Gas processing plants. The project is taken up in phases.

Climate Change and Emission Management

The effects of climate change can be observed across nations. The significant impacts of climate change are changing weather patterns, rising sea levels, more extreme weather events etc. The 13th Sustainable Development Goal (SDG) articulates about taking urgent action to combat climate change and its impacts. Our Sustainability policy illustrates our commitment towards the reduction in GHG emission through enhancement in the processes. G4-DMA, G4-EN4, G4-EN7, G4-EN15, G4-EN16, G4-EN17, G4-EN19, G4-EC2, G4-EN30

GAIL is an active participant in the "Climate Change Risks: Preparedness for Oil and Gas Sector" by TERI through Memorandum of Understanding (MoU) with FIPI (erstwhile PetroFed). The study will provide a comprehensive analysis of threats posed by Climate change to Oil & Gas sector, participating companies and shall provide a way forward to tackle the challenges, risks posed by climate change. The study will suggest suitable measures for the Oil & Gas sector to achieve India's NDC target of reducing emission intensity of GDP by 33 – 35 per cent below the levels in 2005 by 2030.

The study would further highlight how the global market and technological options are likely to change as a result of global climate policy measures; and how the 1.5° and 2° scenarios of global warming are likely to affect the infrastructure and operations in different climatic zones of India. We have worked towards the cause of environment extensively through our pipeline networks which aid in reducing tanker traffic on roads towards





creating a better environment and promoting higher standards of safety.

GAIL's GPU at Vijaipur is processing rich natural gas from the HVJ Pipeline to produce C2-C3, LPG and other liquid hydrocarbons. In the Gas Sweetening unit, CO2 from the rich gas is being removed

and vented to atmosphere. CO2 removal at gas sweetening stage offers multiple benefits. First and foremost, the energy consumption in transporting the natural gas(NG) to its consumer reduces as the total volume of gas to be transported gets reduced. Secondly CO2 being acidic in nature causes

corrosion in the pipeline and therefore its removal improves the pipeline safety. Last but not the least the efficient burning of NG gets a boost due to removal of CO2content. At Vijaipur, as per design, at a processing capacity of 21.12 MMSCMD rich HVJ gas, venting of the CO2 is e 73.5 TPH.

The mitigate the CO2 venting at GAIL Vijaipur feasibility study has been carried out to supply 30 TPH of CO2 to National Fertilizer Ltd.(NFL) for its consumption for production of Urea by laying a pipeline from GAIL Vijaipur to NFL Vijaipur .

Replacement of TEGs by Grid power at pipeline installations

To extensively save fuel gas pipeline installations in Mumbai region have been modified in accordance with utilization of Grid power instead of Thermo Electric Generator (TEG)

To reduce energy consumption the existing air conditioners have been replaced across numerous installations with energy efficient 5 star Bee (Bureau of Energy Efficiency) rating

Replacement of conditioners with rating 5star Bee air conditioners

Installation of Motion Sensors

To minimise wastage of enery motion dectetors are installed at Manasarampur to control turning off the air conditioners

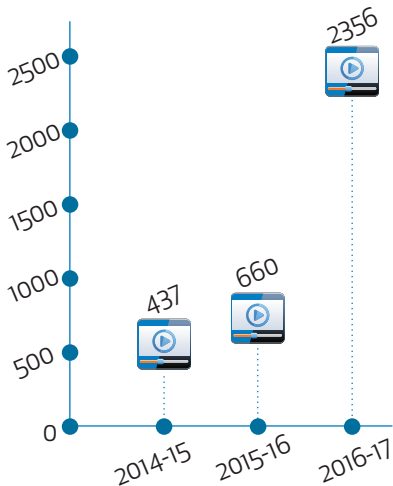
IEDs have taken the place of the conventional lighting system at various lacations to conserve energy

Replacement of conventional lights with more efficient lights (LEDs)

Installation of Pump motor of increased power

Installation of Pump Motor of 350 KW instead of 500 KW in Mist Cooling system of GCU-1 unit of GAIL Pata

Video Conferencing Hours



Increasing the Natural Gas in Energy Mix

Saving Fuel by Transportation by Pipelines instead of using Trucks

CSR Program of Rural bio-gas plants

Landfill Gas Pilot Project (LFG)

Green Building

Promotion of IT such as Video Conferencing

Wind & Solar Renewable Energy

Global Methane Initiative (GMI)

Vapor Recovery from LPG Spheres

Green Belt Development

Heat Recovery Steam Generation (HRSG)





We at GAIL closely observe climate change risks and opportunities and have initiated various projects and mitigation initiatives to regulate them. To reduce the amount GHG emission occurring due to business travel use of the video conferencing facility was promoted.

Water management

Water is vital for all forms of human life. The 6th SDG articulates about clean and accessible water for all, being an essential part of our world. It is our

consistent endeavour to minimize our resource consumption. G4-DMA

We at GAIL aim for reduction in Fresh Water Consumption and Zero Waste Water Discharge. Our operations do not generate difficult to treat wastewaters. The prime components of generated effluent are floor wash water, cooling water blow down and sewage water. The gas processing plants have an effluent treatment plant for necessary treatment of effluent water generated in the process. No effluent water is discharged outside the premises.

Treated effluent water is recycled and used in-house for horticulture purposes within plant and township premises.

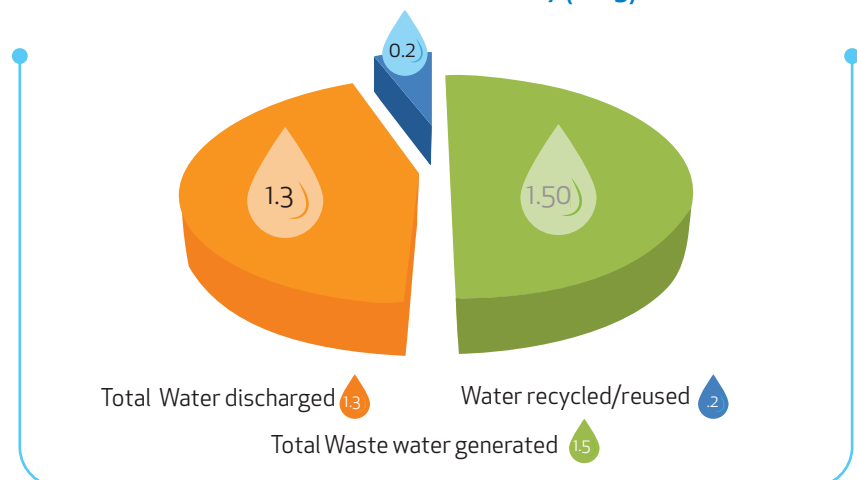
All discharge occurring from our premises are compliant to the norms laid by the State Pollution Control Boards. There are units which conform to the zero-discharge i.e. no effluent water is discharged outside the plant premises (e.g. our units in Vijaipur, Gandhar, NG compressor stations and LPG pumping stations). The waste water discharges and run-offs to the local water bodies in our operational vicinity also does not display any

For water conservation and optimum use of water initiative on Rain Water Harvesting taken and Drip Irrigation at SAMAKHIALI

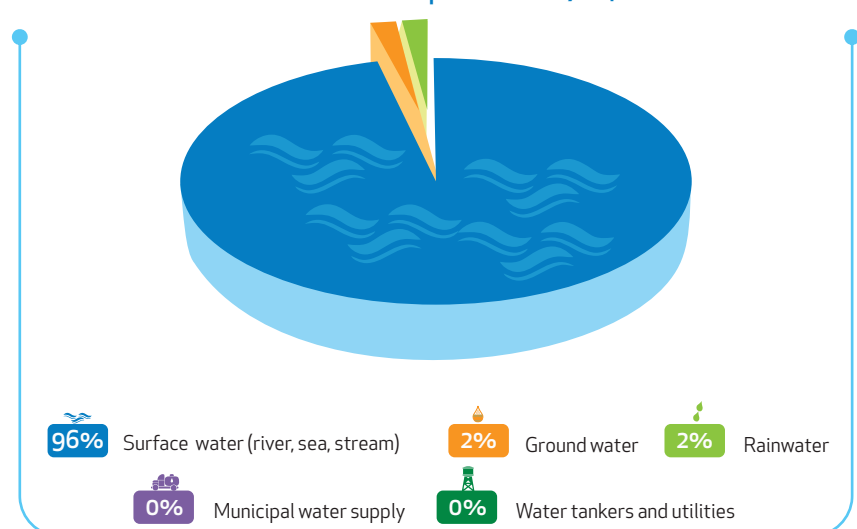
For recharging the ground water Rain Water Harvesting System was augmented in FY 2016-17. leading to approx. 1000 Cubic Meter water is being recharged in the ground annually at MANSARAMPURA

To regulate and control wastage of water in our townships due frequent failure of float valves in overhead tanks a Quality Circle initiative was taken which resulted in reduction in fresh water consumption, motor operations and civil maintenance cost at NASIRABAD

Waste Water Performance FY 16-17 (Mm3)



Total water consumption FY 16-17 G4-EN8





considerable impact on them and discharge at all locations (if any) is compliant to respective state pollution control board norms. At our Pata unit, 1500m³/ day treated waste water is being reused which is more than the stipulated 1200m³/ day as per environmental clearances for the new PC II Plant.

There has been no considerable effect on the water sources considering the water withdrawal for our locations. G4-EN9

Rainwater harvesting by constructing check dams for promoting local biodiversity and for ground water recharge by construction of harvesting pits near new/ existing bore wells have been taken up by various sites to deal with the challenge of water availability at project sites. Major rainwater harvesting initiatives have been taken across GAIL sites in FY 16-17 of which 4 nos. have been developed at Vijaipur site itself for ground water recharge. At Pata site, 9873m³ of Rainwater has been harvested in FY 16-17.

Waste Management

As a responsible organization, our concern lies with minimizing waste generation and reducing environmental damage by efficiently segregating, treating and disposing based on the type of waste generated. We at GAIL are not involved in any activities related to the import, export, transporting or treatment of generated waste which falls under the hazardous category G4-EN25 according to the Basel Convention. G4-DMA

Our petrochemical unit produces tar, waste water treatment plant sludge, molecular sieves, tar ash and slope oil as hazardous solid waste which is free of any heavy metal content. We have

wastewater treatment plant in Pata, and other wastes are disposed on regular basis with the aid of a Treatment, Storage and Disposal facility approved by the Uttar Pradesh Pollution Control Board. The molecular sieve and tar ash generated are securely disposed-off in a landfill/ the approved TSDFs (Treatment, Storage and Disposal Facilities). The slop oil generated is sold to statutory approved parties for recycling and reuse.

Batteries and other such waste material are returned to the respective vendors for recycling while procuring the new batteries.

Liquid Hazardous Waste such as spent oil and waste oil are collected in drums and stored in a designated and demarcated area and are disposed through re-processors which are authorized by CPCB/MoEFCC/SPCB (Central Pollution Control Board /Ministry of Environment, Forest and Climate Change / State Pollution Control Board)

GAIL Vijaipur, being a zero discharge (in terms of Waste water) is also well on its way to towards installing Waste Composting unit in its township area that shall convert all Organic Waste to compost manure for utilizing in its green belt development. The project is under preliminary stage of execution and is expected to be commissioned by April 2018. Additionally, the recyclable material that is generated under Municipal Waste is also expected to be sorted, collected and finally disposed to authorized agencies with Certificate of Disposal issued to GAIL. Since all Hazardous Waste is sent to authorized Recyclers/ reprocessors and E-waste in process of being auctioned to SPCB authorized recyclers, with this project GAIL Vijaipur is well on its way to

achieving Zero-Waste credential for its site.

E-waste Management

GAIL falls under the 'Bulk Consumer' category of E-Waste and filing annual returns in terms of its E-waste generation with respective SPCB/ CPCB in compliance of E-Waste Rules, 2016. Thus, GAIL is committed to follow sound waste management practices by handing over waste to SPCB/ CPCB authorized re-furbishers/ recyclers for disposal or authorized collection centres of Producers as part of its buyback scheme under Extended Producer's Responsibility (EPR) of said rules. These practices are also subject to Environment, safety audits along with Pollution Control Board inspections thereby ensuring 100% adherence towards its effective management.

Air Emissions Management

GAIL prioritizes its environmental considerations throughout the project at phases such as technology selection, process design and projects execution. All our plant - Gas Processing Unit, Gas Cracking Unit, HDPE and LLDPE units are state of the art and from world renowned process licensors. The level of pollutants is consistently maintained much below the nationally stipulated norms with use of natural gas as fuel. Stacks of adequate height are built for effective dispersion of pollutants. Low NO_x burners are used in all the furnaces. Loading facilities are provided with vapour return circuits. Gas detectors have been installed to ensure quick detection of any gas leak.





At GAIL Vijaipur, the new C2/C3 Recovery & Gas Processing Unit is responsible for not only Liquid Hydrocarbon extraction and production but also recovery of C2/C3 fraction used as feedstock for Pata petrochemical complex at Pata (U.P.). Online plant emission parameter and effluent discharge parameter from respective Analysers have been mapped to CPCB and UPPCB website for cloud based monitoring as 1st "Industrial Internet of Things"- IIOT system commissioned at GAIL Pata. All emissions and effluent parameters of GAIL Pata is seamlessly connected with CPCB & UPPCB servers for online monitoring. This plant is state of the art in terms of Environment Management and replete with real time monitoring of all environment parameters such as Ambient Air, Emissions and Treated effluent parameters (Treated effluent is utilized in-house for Horticulture purposes thus conforming to Zero-discharge). These parameters are then uploaded online through an integrated local server installed at Main Control Room (MCR) at Vijaipur to Central Pollution Control Board, New Delhi via Internet connectivity where data is displayed on real time basis. A real-time Meteorological station is also in place at the Local F&S station for monitoring various wind and other atmospheric attributes.

Greenbelt and Biodiversity

GAIL holds strong commitment to environment sustainability which is also one of the fundamental elements of our Vision statement. We undertake

initiatives to safeguard environment and biodiversity along with our diverse business segment. Extensive afforestation is done on each site and at least one third of the area is maintained as Green belt. As part of Green belt initiatives, GAIL Vijaipur has carried plantation of more than 700 nos. of saplings that includes trees, shrubs of endemic species on various occasions such as HSE Signature campaign, Environment Day celebrations as well Birthday Garden concept carried out every month where GAIL Employees plant saplings on their birthday. In FY 16-17, our Pata site planted 1496 saplings as part of Birthday garden initiative. Further, seed bank for flowers & seasonal plants, sapling banks have also been developed for distribution as well as to encourage participation of GAIL Vijaipur residents and others for a clean and green environment. The first step towards conservation of biodiversity is assessment and documentation. OG4, G4-DMA, G4-EN11

As per the Environment Impact Assessment Notification 2006 schedule item 6 (a), oil and gas transportation pipelines (crude & refinery / petrochemical products), passing through National Parks / Sanctuaries / Coral Reefs / Ecologically sensitive areas including LNG terminal requires environmental clearance only.

All the Process Plants have developed significant green asset at their respective premises. The Green Reservoir is now home to many exotic and indigenous species of both flora & fauna. The installations also have other life sustaining reservoirs i.e. huge water bodies in and around the premises

creating, sustaining, and attracting aquatic & other species. GAIL installations are also home to few of the species falling under Schedule I of Wildlife (Protection) Act and Threatened Categories of IUCN. Such species which have been found at GAIL installations (Vijaipur, Pata, Vagodhia, Gandhar, Usar and DBPL) are as in the infographic. More details on Assessment of Biodiversity at major installations can be read in the case study.



Protected Species at GAIL Installations



Introduction

We have been continuously taking initiatives to safeguard environment and biodiversity along with its diverse business segment. We understands the value of the green spaces present within its premises, and would like to feature the unique aspects of the flora and fauna to the general audience. Biodiversity

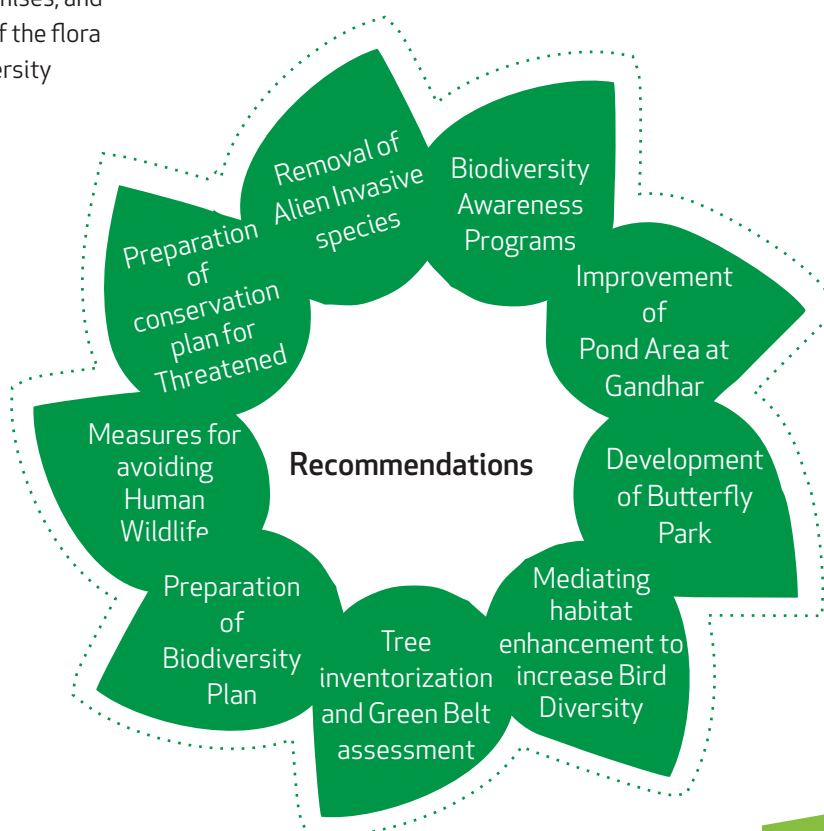
Issues and Threats

- Invasion by alien species of flora
- Water hyacinth invasion in ecological pond at Pata
- Scrap management at Vijaipur, Pata and Vaghodia
- Loss of native vegetation at Usar
- Human wildlife conflict at ymt9114and DBPL
- Scarcity of water at Vijaipur

All our Process Plants have created a huge & significant green asset at their respective premises. The Green Reservoir so created with painstaking efforts of local management over the years is now home to many exotic and indigenous species both flora & fauna. This was in spite of hostile soil conditions at various installations

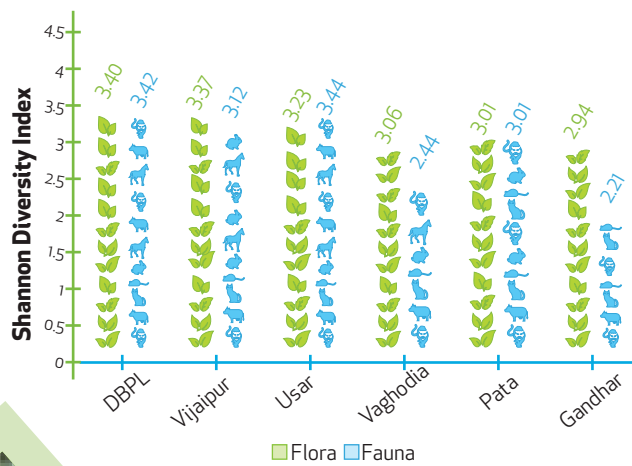
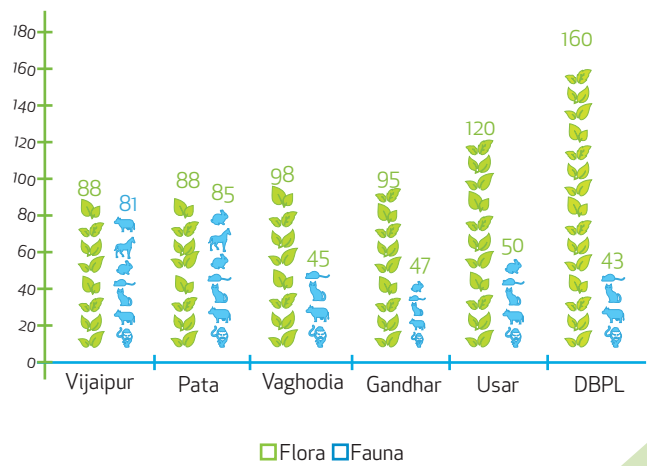
Objective:

- Rapid Assessment of Biodiversity at Sites
- Identifying issues and threats to their sustainability
- Drawing conclusions and recommendations based on the assessments
- Translating the key biodiversity features into a Coffee Table Book





Flora & Fauna Diversity at GAIL



Mini Zoo from Recycled Waste Material

At GAIL installations clean, green & healthy environment is promoted through various initiatives. At GAIL complex, Vijaipur a Mini Zoo has been constructed using waste & scrap material (i.e. old damaged & disposable concrete berm blocks, old unusable & disposable big dish antennae taken from GAIL Tel department and other waste items etc.). This is in line with Gazette of India, Part-II, Section-3, subsection (ii) dated 29.3.2016, emphasizing on use of recycled material, construction & demolition waste by Government of India. Birds/ parrots, rabbits and ducks have been kept in this zoo. There is also a water body nearby for ducks.





projects are presented by QC team members at pan-India conferences e.g. QCFI events etc. This year, a total of 133 QC projects were registered with 110 success story resulting in cost saving Rs 10.43 Crores in FY 2016-17.

Further, as an initial step towards achieving Operational Excellence, the DELTA (Delivering Experimental Learning Through Application) initiatives have been launched at various O&M sites for systemic and continual improvements in Project Directorate. The objective of the initiative is to channelize various improvement ideas into actual implementation at site rendering creative thoughts of the individual and teams for improvement in various business segments.

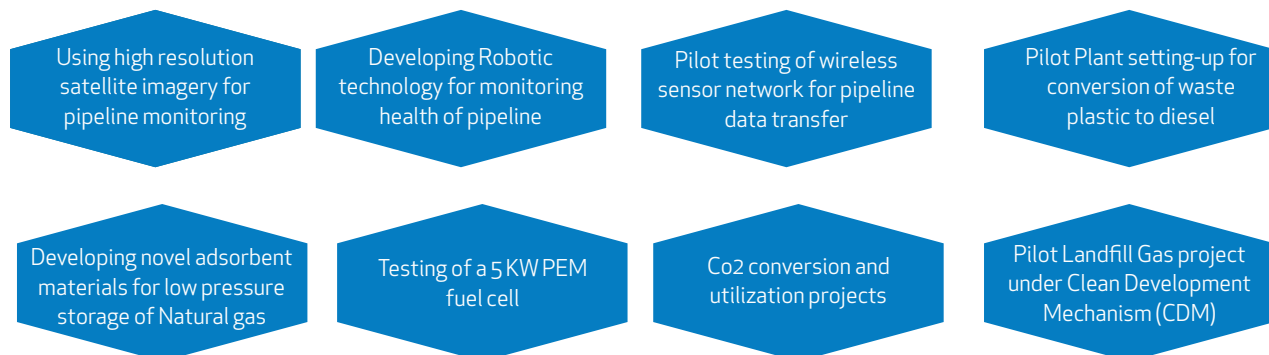
Research and Development

Conventional energy sector across the globe is at a point of inflection and is facing increased competition and substitution from renewable and non-conventional energy sources. We are fully geared up to face these business challenges, through innovation and Research & Development efforts, to convert them in to new business opportunities

We are committed to spend over 1% of its PAT on Research and Development (R&D) works to address the current industry challenges for improved safety, productivity, and environmental sustainability. Our R&D expenditure in FY 2016-17 was INR 28.47 Crores which is more than the mandated amount of INR 23 Crores.

We are carrying out collaborative research works in the identified thrust areas with various research institutions and CSIR laboratories. In addition, we are also pursuing various developmental projects at our sites for improving safety and efficiency of the existing installations. We are also in the process of setting up an in-house R&D centre to carry out more specific and focused research works in key business areas.

Our research efforts are also focused on augmenting the gas supply through new sources. GAIL is a member of the National Gas Hydrate Program for hydrate resource discovery and exploration. We are also an Industrial partner in the Indo-US



strategic research initiative under Solar Energy Research Institute for India and USA (SERIUS) program. The major research and development initiatives taken by R&D for FY 2016-17 are:

In addition, GAIL has two projects, which were registered with UNFCCC as CDM project.

- Utilisation of Landfill Gas Project at Ghazipur, Delhi: we have implemented a pilot Land Fill Gas (LFG) Project at Ghazipur Landfill site. Currently, 70 to 80 m³/hr of Landfill Gas with 20% Methane content is being extracted and safely destroyed in an enclosed flare system while a part of this low-quality Landfill gas is used to generate 30KWh of electricity using Micro-Turbine for reduction of GHG and pollution.
- GAIL has also installed 5 MW Solar Power at Jaisalmer.

Further, to promote the culture of innovation and knowledge management across the organisation, a Suggestion Scheme has been established to elicit new ideas from employees. The proposals received under the scheme are evaluated in a time bound manner and CMD trophy is awarded to the best suggestion.

In addition, to promote the Start-up ecosystem in India. We have allocated a corpus of INR 50 Crores. We shall be primarily investing in Start-ups in its Core Business Areas besides few non-Core Areas like Health, Social & Environment.





GAIL Start-up Initiative – Pankh

Start-Ups have the potential to improve existing businesses, create new business, increase manufacturing base and create self-employment opportunities. Start-Ups can provide the much needed multiplier effect for growing the economy.

GAIL launched the initiative 'Pankh' (Wings) to nurture the spirit of entrepreneurship. As a part of this initiative, GAIL has set aside a fund corpus of INR 50 Cr to help start-up entrepreneurs realise their potential. The creation of the corpus fund under 'Pankh' was only a small beginning to promote innovative ideas and this can be improved, depending upon the response of entrepreneurs and the concepts received under the initiative. The processes have been set and a corpus has been created for investing in Start-ups and GAIL would also provide mentoring to them in core areas of the organization. This would help Start-ups to realize their full potential at the earliest. GAIL has also launched a separate web portal that can be accessed through the GAIL website where start-ups can submit their proposal.

A total of 42 Proposals were received from Start-Ups, out of these, 32 Proposals were considered for shortlisting and evaluation. Investment Agreements have been signed with 4 Start-Ups for a total commitment of Rs. 5.12 crores. The Investment Agreements with another 6 Start-Ups are being finalized. In addition, GAIL has signed MoU's on Cooperation with IIT Madras Incubation Cell and IIM Lucknow Incubation Centre for supporting the Start-Ups incubated in these Centres.

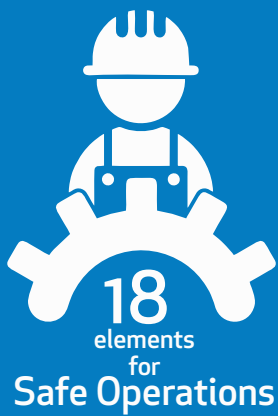


Launch of GAIL Start Up Portal - Pankh by GAIL Management

CHAPTER

6

Health and Safety



HSE score
for GAIL

92.94

FY 2016-17



Glimpses of Mock Drill at GAIL site



Health and Safety

Health and Safety are at the core of all our operations at GAIL. The operational conditions of the oil and gas industry call for robust health and safety management systems. Adequate safety measures are taken and ensured at all levels. Our state-of-art technologies, trained and competent manpower and established systems are the foundation of our safe operations. Thus, abiding by all safety guidelines and regulations is of immense importance to us.



Our Approach



We at GAIL believe that health and safety, continue to be among our crucial priorities. We understand the criticality of failing to operate safely and thus HSE is an integral part of the management of our business. Keeping people and assets safe, and being good custodian of the environment are vital our business well. Our management lays emphasis on continual improvement of the management systems. Preventive and protective measures are also emphasized on, to reduce the occurrence of incidences at the workplace. Our HSE policy is robust and covers all aspects of Health, Safety, and Environment. The Policy is a key document which drives down health, safety, and environment procedures in detail. Following them is mandatory at all our locations. The implementation of HSE Policy at all sites is periodically monitored through internal and external audits, HSE verification checks and visits by senior officials.

An elaborate & comprehensive Health, Safety & Environment Management System is in place across all our locations in GAIL. The Health, Safety & Environment Management System (HSEMS) has been formulated based on OISD Standards and best practices in vogue in Peer Industries. Our Corporate HSE policy, signed by our Chairman & Managing Director is the foundation of HSEMS. We are dedicated to maintain an environment by giving highest priority to occupational health and safety. We encourage the employees and contract workers to adopt safe working habits and behavior to ensure safety at all levels. The HSEMS is periodically reviewed with the objective to upgrade and be relevant with changing technologies and regulatory requirements.

HSE Management System consisting of 18 elements is in place to cover all facets of our activities and to provide guidelines to the sites for achieving safe operations. The implementation of HSE Policy at all sites is not only periodically monitored through internal systems but also through internal and external audits, random HSE verification checks and visits by senior officials. To put more thrust on constant monitoring and evaluation of HSE Performance of Organisation 'HSE Score' was devised. HSE Score methodology was further reinforced by providing adequate linkages with recently implemented EHSM





SAP, Monthly Safety Day and capturing timelines for various compliances across all sites. We have achieved average HSE score of 92.94 during FY 2016-17, which is well above the MoU target of 90.

During the long journey from primarily being a Natural Gas Transmission Company, diversified into various business segments like Petrochemicals, Gas Processing, LPG, and Exploration & Production etc., we always strive to embrace best practices adopted by premier organizations in India and abroad. Health, Safety and Environment Management System at installations is well synchronized with other management system to avoid conflicts and to ensure effective implementation in all spheres of our activities. Over a period, we have undertaken various safety related initiatives which rendered us among safety leaders in the industry:

- The process plants and cross-country pipelines are designed as per the National & International Standards. HAZOP study and Risk Analysis is carried out during design stage to identify the hazard and risk mitigation. Further HAZOP study and Risk Analysis is also carried out in regular intervals and suitable risk mitigation measures.
- Health & Safety functions across GAIL are manned and led by competent core professionals having relevant work experience.
- State of the art fire and safety equipments and technologies are deployed across all installations of GAIL.
- Strict adherence to regulatory guidelines of OISD and PNGRB etc. are met with.

- Established and well-documented Emergency Response and Disaster Management Plan (ERDMP) are in place and review of the same is carried out from time to time.
- Safety Work Permit System is in place at all of our installations to ensure safety during maintenance works.
- Structured HSE Training System is in place. Well-equipped training ground is used for live demonstration of various emergency scenarios expected to arise within the complex to train employees.
- For ensuring personal safety, adequate Personal Protective Equipments are used for specific types of jobs.
- SAP and other digital platforms are extensively used for HSE related applications.

We also refer the latest happenings across the peer organisations to gain insights of HSE Management System Implementation.

Safety Leadership

GAIL's Vision Statement reiterates our commitment to highest level of Operating Standards in our journey namely "Be the undisputed leader in the natural gas market in India and a significant player in the global natural gas industry, by growing aggressively while maintaining the highest level of operating standards". Health, Safety, and Environment are embedded in our "Core Organizational Value" and we promote highest level of safety in our operations, health of our employees and a clean environment. Safety Management plays a vital role in creating safe working environment during Construction, Operation and Maintenance.

Our Health, Safety, and Environment Policy Statement has been approved by Chairman and Managing Director with a commitment to conduct business with a robust and integrated HSEMS. We are involved in industrial processes which are hazardous in nature and pose increased risk to human lives, property and environment. There are legal,



A view of GAIL's Stall at leading Exhibition





financial as well as moral reasons to manage HSE at workplace to conduct business having aim of 'Zero Accident'. Continuous efforts in the form of engineering controls, administrative controls and personal protective equipment are being placed at O&M installations to achieve the desired goal. A dedicated Board Level Sub-Committee monitors the HSE performance and emergency preparedness periodically. The Committee is chaired by Independent Director with functional Directors as members of the Committee. 10th day of every month is observed as "Monthly Safety Day" across the organization. On this day, the Officer In-Charge of all installations (OICs) exclusively devotes a half day to review all HSE aspects of the installation under their jurisdiction. The exception report on observations is further reviewed by Director (HR) & Director (Projects) and corrective measures are being taken.

Leadership is visible throughout the organization and a top driven approach has been percolated across GAIL. As a result of various initiatives taken during

last few years has helped in achieving 'Zero Major Reportable Incident' during the year 2016-17.

Emergency Planning

With our focussed approach on Incident Prevention, we consider emergency preparedness indispensable as the oil and gas sector has significantly high safety risks. GAIL has many segments of operations like Natural Gas & LPG Pipeline, Process Plants and Petrochemicals. All of our installations are having their installation specific Emergency Response and Disaster Management Plan (ERMDP) in accordance with PNGRB Regulations. In order to enhance the efficacy of emergency management system across GAIL, mock drills are conducted in regular intervals. Further, as per the Incidents reported to PNGRB for FY 16-17, total five no. of cases were reported for Level 1 Incident and nil for Level 2 & 3 Incident OG13

Our workforce is alert and well-equipped to handle situation of emergency as they are trained on basis

of the guidelines shared with them. Improvement in our crisis management system has been brought about for faster communication with top management in case of an emergency with the help of group SMS and voice message service.

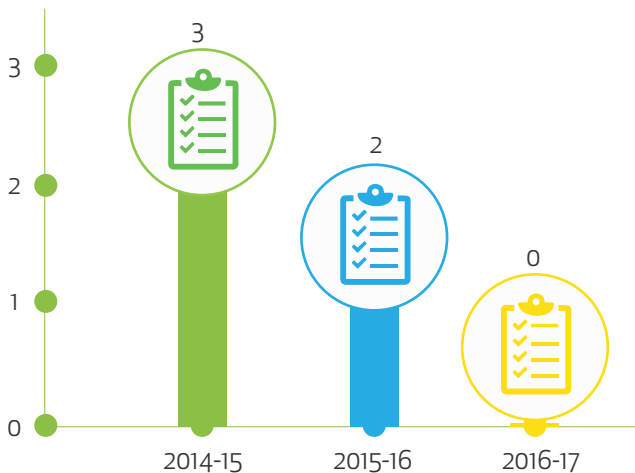
To ensure preparedness mandatory systems and procedures are made available at appropriate points of our operations. Fire-fighting equipment's like gas suppression system for control rooms, water spray system for pumps, flanges and hydrocarbon storages, DCP flooding system for specific chemicals/catalyst storages etc. are installed. In addition to the above, in order to put out any small fires, first aid fire-fighting equipment's are installed to fight any fire at its incipient stage. Safety induction training is imparted to any new employees, contractor employees, CISF employees and visitors in all of our installations.

Employee Safety

We firmly believe that health and safety of everyone working for the organisation including the direct and indirect workforce is of prime importance to us. Our goal is to have a safe working environment promoting 'Zero Accident'. We strive to continually improve our safety performance and learn from every incident. We have established procedures and safe working practices which are followed across all sites.

Training has been identified as compulsory requisite of HSEMS. Safety training is included in the internal MoU of GAIL. Trainings on safe working procedures and practices are regularly imparted to employees and contractors. Prior to entry of any

Major Incident Statistics

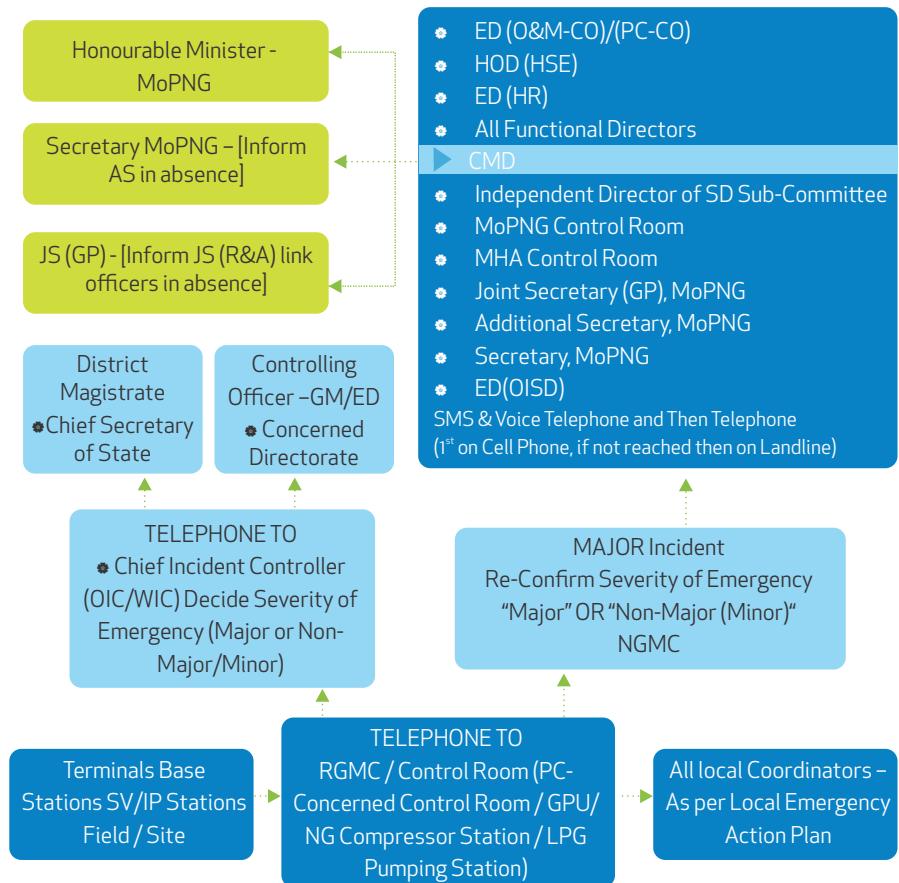




contract employees' to our sites, compulsory fire and safety training is imparted.

G4-DMAA medical check-up is carried out for the workers prior to deploying them on job in accordance with the Factories Act. The workers are provided with a safety kit and personal protective equipment (PPE). To ensure safe execution of the job work permit system (OISD-105) is followed and supervised by a GAIL employee. Discipline is brought about by enforcing to follow Standard Operating Procedures (SOPs). The operators are given the respective SOPs to be referred for the safe execution of jobs. The engineer-in-charge briefs the operators prior to assigning them with maintenance jobs. Display of Material Safety Data Sheet (MSDS) boards, Do's & Don'ts and safety instructions in the local languages are placed near by the processing/handling/storage area/chemical handling areas and other strategic locations.

Incident Reporting Chart



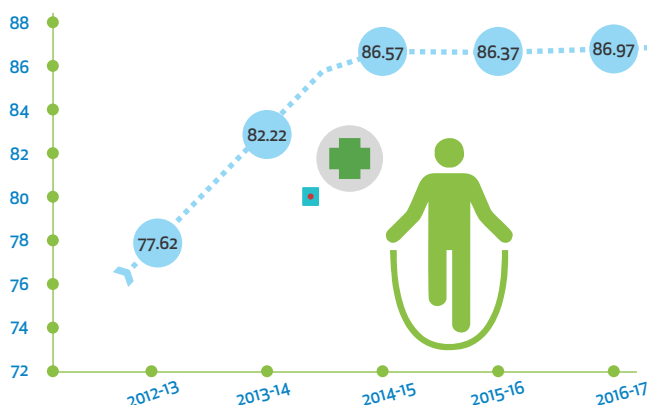
Occupational Health & Safety

We have formulated occupational hygiene measures and medical surveillance programmes to monitor

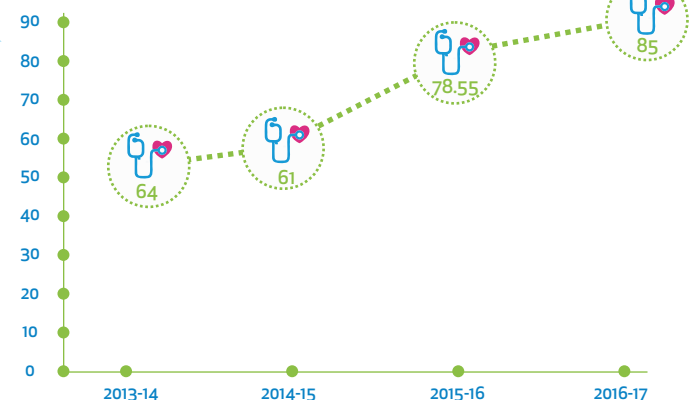
the occupational health of our employees. In order to ensure proper infrastructure and health initiatives necessary guidelines for maintenance of Occupational Health Centre at sites exists. Under this guidelines, specific

procedures to monitor employees' health has been defined and the same is monitored at Corporate level through Corporate Occupational Health Committee.

Health Index of Employees



Occupation Health Checkup (%)





Behavior Based Safety

“Safety culture is the product of individual and group values, attitude, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of the organisation’s Health and Safety programmes.” Safety is an array of choices made by the workforce on daily basis. The three main influencing factors for safety choices are: recognising hazards and evaluating risks, motivation to be safe, and the focus on the performing ongoing task safely.

The employee’s actions towards safer outcomes is pivotal to steer and upgrade our health and safety practices. Behavior Based Safety (BBS) implementation is the most comprehensive way for companies to promote achieve impacts like visible leadership, increased safety behaviours, injury reduction and encouraging employee participation. Striving to make the workplace safer requires a partnership between the company and its employees. We realize that only by permeating the safety policies, systems, processes, and procedures in our daily lives leads us toward an incident free environment. It has been 3 years now that the BBS program is smoothly functioning. The Corporate Steering Committee and task force supervise the implementation of BBS and the functional committee implement the BBS at site level. Sustaining “Behaviour Based Safety” drive implementation is a big challenge. Understanding this Challenge, following actions have been taken to drive/sustain BBS at respective sites:

1. Development of web based BBS Centralized Portal to facilitate the observationfeedback process and smooth implementation of BBS across all GAIL installations.
2. Steering committee headed by OICs and functional committees

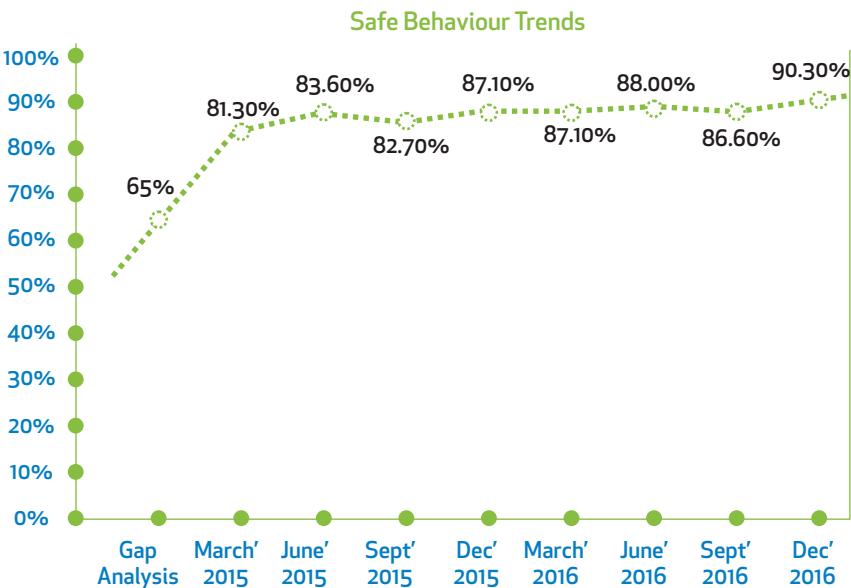
- headed by respectiveHODs have been constituted to drive further BBS at their respective sites.
3. 119 Nos. Lead Trainers have been developed at sites for further transformation of safety culture at their respective sites.
 4. Effective Implementation of Behavioural Based safety at all locations and for all employees working at Site through awareness workshops, training, and sensitization.
 5. BBS promotional schemes to encourage employees and contract workers.
 6. In addition, with Site specific awareness programme, Regional

Safety Leadership Cum BBS Workshops are being organized on quarterly to penetrate BBS further.

The impact created by the site-wise drives organisedare visible leadership, increased safety behaviour, injury reduction and encouraging employee participation. A Case Study on “Behavioral Based Safety Program Implementation at GAIL” was undertaken by one of the PhD Scholar at IIM Indore. The objective of the study to understand the cultural transformation through BBS concept and insight information on inculcating mindset of safety which essential to reach out each employee right from the top management to the contractual staff down the hierarchy.



On the Occasion 16th HSE Workshop on Occupational Health





Security Command and Control Center (SOCC)

GAIL has a pipeline network of 2033 KMs in NCR region for Natural Gas & LPG transmission. This network runs through the densely populated areas of Delhi, Haryana, UP, Uttarakhand, Rajasthan, Punjab & Himachal Pradesh. This network serves as a fuel lifeline for the area.

Ensuring the safety, security and integrity of this pipeline network is of utmost concern. The current scenario of increased developmental activities in the area articulated the need for upgradation of the safety and security arrangements of the pipeline network. Thus, it was deliberated to use advanced technological methods

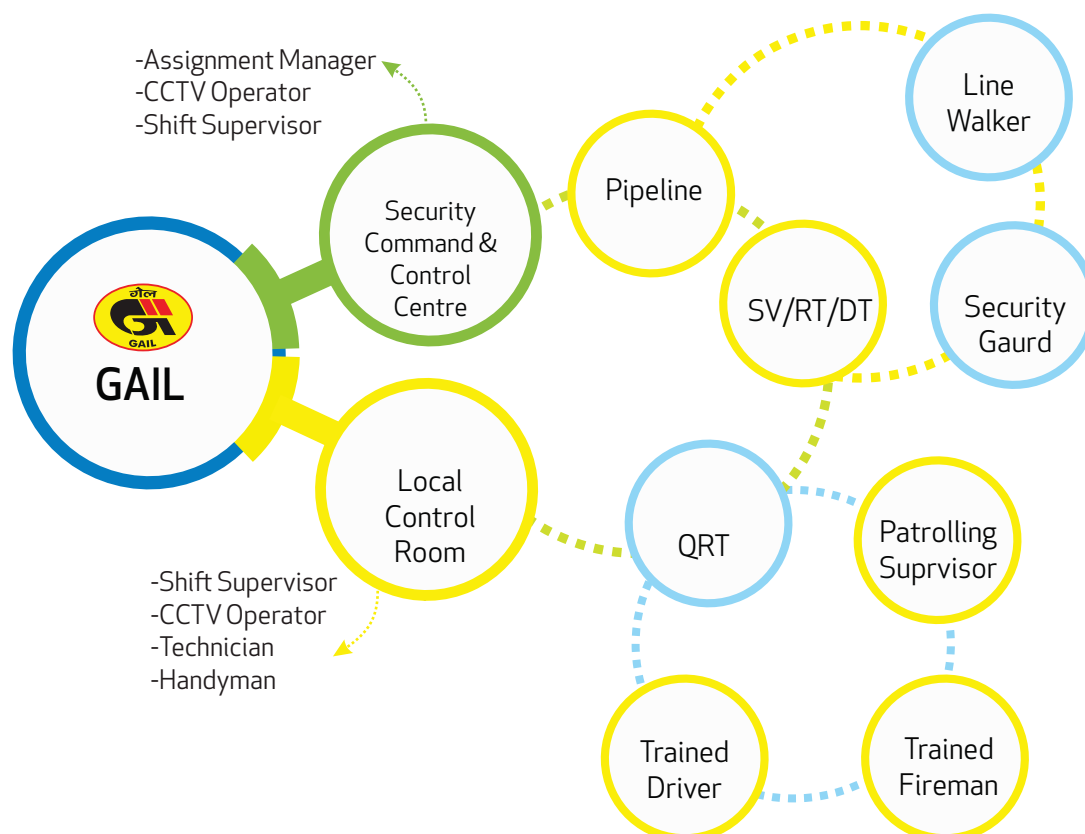
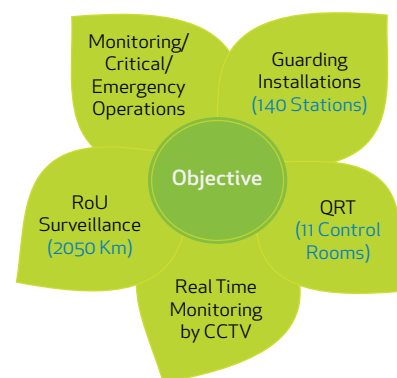
for the mitigation of the enhanced threat perception.

To enhance the safety, security & integrity of natural gas Pipelines and its installations the traditional methods were redefined and a pilot project of Pipeline RoU Surveillance including foot patrolling and watch & ward services was deployed in FY2016-17.

Salient Features of SOCC are :-

- All critical activities of Pipeline Safety, Security, and O&M integrated on one platform.
- Real time reporting and prevention of Incidents in RoU (averted 81 potential incidents).
- Live and uninterrupted Surveillance of installations

- Prompt Emergency Response through Quick Response Team.
- Effective monitoring of critical pipeline operations like Pigging etc. through CCTVs.
- Automatic archiving of Data including CCTV footage.
- Additional In-Direct employment generation





Supply Chain Safety

Safety of our operations, workforce, and the communities around us is a matter of great significance. We strive to form and cultivate a safe operating environment. Despite giving safety paramount importance we realized that it is not adequate to protect us from hazards. Bringing about reform in the supply chain seemed necessary, this lead to the incorporation of stringent HSE requirement in the purchase and procurement documents / contracts.

The key areas of our supply chain safety are covered in the subsequent section of this chapter.

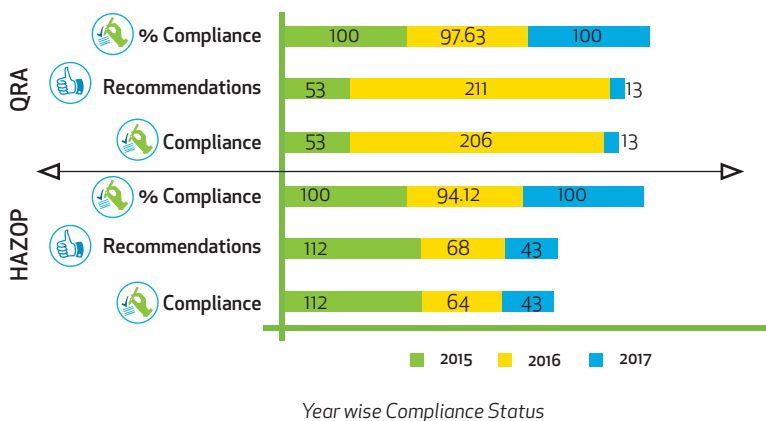
Pipeline Safety

Pipelines are crucial to GAIL's business for the transportation of NG and LPG. Thus, the safety of pipelines is cardinal. The scrutiny of integrity of the pipeline is facilitated by the Centralized Pipeline Integrity Management System (CPIMS). It has been rolled out for 9100 km of pipeline. The module components

which constitute the CPIMS are Data Base Module, Threat & Risk Cathodic Protection

Analyst, Geospatial Analyst, Pressure Testing Module, Task Manager, Reporting Module, and Management Dashboard. The CPIMS has an internationally accepted data base system i.e. Pipeline Open Database (PODS) for management of all pipeline related data. Numerous measures have been taken to improve on pipeline safety.

To assess the integrity of the non-piggable pipelines Magnetic Tomography Method (MTM) & Contactless Magnetometric Diagnostic Method (CMDM) has been adopted. It facilitates spotting metal defects and weld joints, assess the state of corrosion, and monitor the development of corrosion. Quantitative Risk Analysis and HAZOP are being carried out by Third Party Agencies across the GAIL Installations.



Pipeline Intrusion detection System (PIDS)

For a real time surveillance of pipelines and to protect them from third party damage, GAIL installed Pipeline Intrusion detection System (PIDS) on Pilot basis in 72 Km Piyala - Loni section (Part of Jamnagar Loni LPG Pipeline) and approx. 175 Km of Vizag to IP-1 section (Part of Vizag-Secunderabad LPG pipeline). The system works on Distributed Acoustic sensing Technology using existing optical fibre cable (OFC) along the pipeline. Through this system various events like manual excavation using hand tools, machine

excavation, vehicle movements, agricultural activities, valve operation, fibre break, scrapper pig location etc. are identified automatically and alarm is generated for the operation team to respond as required.

G4-SO2 We consistently engage with the local villages and are well acquainted with the issue of pipeline area encroachment. There are numerous steps initiated and a Public Awareness Policy defining the key safety message has been floated. The village people of the nearby vicinity are engaged, flyers in local language are distributed and awareness programs are carried out at regular intervals for

them to acquaint them with the importance of the pipeline integrity. We engage local villagers in ensuring pipeline safety by hiring them for reporting any abnormality or pipeline exposure and suitably rewarding them. Monthly follow-ups are held with the district authorities for actions taken on removal of encroachments in RoU. Remote Methane Leak Detectors are being used for monitoring leakage in difficult to reach terrains. The instrument helps to detect quickly and efficiently leaks up to one hundred feet away allowing remote detection of hard-to-reach areas and difficult terrains.





Public Awareness: Campaigns in villages along NG pipelines, Maharashtra region

The NG pipelines run across different districts of Maharashtra covering large number of villages. At present the pipelines span across 5 districts, Pune, Raigad, Ratnagiri, Thane and Palghar and also include some portion of Navi Mumbai area. As the pipelines run through the well-populated areas through large number of villages and cities, it is very important to spread a general knowledge about the pipelines and build the confidence of common public. To achieve this, the awareness programs are conducted under the Corporate Guidelines for Public Awareness. The awareness programs help in spreading the information about pipelines and their operation and maintenance. It also helps in educating people of the DOs and DON'Ts that need to be remembered regarding safety of the pipeline as well as local population. With the help of these programs, the statutory provisions and restrictions/bindings under the PMP Act (1962) are also explained to local population in simple local language. It is explained to the local people that how negligence and inadvertent activities in the restricted area along the pipeline may lead to emergency situations and loss of property as well as life.

It is emphasized that with help and support of common public, the safety and security of pipelines as well as local population can be ensured. Mutual assistance as well as cordial relations with a sense of responsibility between GAIL and local population is very crucial in safe operation and maintenance of such long NG transmission pipelines. They are advised to approach GAIL before taking up any activity in the land around NG pipelines. The local administration is also approached and requested for timely Updation of land related records (7/12 utaraetc) for mention of GAIL Pipeline in other rights. This may eliminate any loss of information during sale or purchase of land around GAIL pipelines. The awareness campaigns include public awareness programs as well as street plays. Street plays are special type of awareness programs in which street plays or पथ नाट्य are conducted at public places of a village to ensure maximum audience. A small play is conducted depicting local characters through which the information is spread to public. Awareness programs of technical nature are also conducted for specific service groups like JCB operators; excavators etc. apart from general information, specific precautions during any construction or repair work are also detailed to them. To enhance the effectiveness, pamphlets and other supporting material (calendars, key chains etc) is also distributed along with light refreshments. The program is conducted in local language i.e. Marathi.





Transportation Safety



All our sites have established controls to manage transport safety risks, including road and pipelines. Loading of hydrocarbons to tankers and wagons is being done whilst following the activity checklist for safety check incorporating statutory provisions. All drivers are trained by competent agencies and journey management plans and maintenance of vehicles are routinely undertaken. Drivers are given Transport Emergency (TREM) cards with the emergency action plan to be followed during transportation of inflammable products (e.g. LPG, Propane, Pentane, and Naphtha) by road. It is ensured that all tankers contain LPG emergency response kit before loading. The Fire and Safety personnel physically check these carrier road tankers based on the guidelines of Central Motor Vehicle Rules (CMVR) 1989, and Static and Mobile Pressure Vessels Rules etc. All records are maintained in the SAP system. For safe operation of product filling in tanker, relevant SOPs are followed and Terminal Automation System (TAS) is used.

Key measures taken Post Tatipaka Incident

Pipeline integrity is safeguarded by foot patrolling at regular intervals to check for any exposure or third-party activity near pipeline. The internal integrity is maintained by doing intelligent pigging at fixed intervals and by Cathodic Protection Monitoring (which helps in reducing corrosion of the pipelines). The integrity of external coating is monitored regularly by Close Interval Potential Logging (CIPL) / Direct Current Voltage Gradient (DCVG) surveys.

The other key initiatives undertaken in recent past are:

- A Centralized Integrity Management Group (CIMG) has been established to closely monitor & maintain comprehensive pipeline database and coordinate the integrity management of pipelines across the organization. Within this group, various sub-groups have also been formed to cater to specialized areas such as In-line inspection, Corrosion Control etc. The Regional Integrity Management Group (RIMG) has also been formed in all pipelines headquarters and working in tandem with the CIMG.
- Standard Operating Procedures are reviewed by international reputed agency M/s. British Safety Council, UK for process plant and M/s. DNV GL for pipelines.
- Empanelment of subject matter experts for expert services regarding Pipelines Corrosion, Cathodic Protection (CP), in line Inspection (ILI), Coating, metallurgy, and welding.
- CPIMS based on Risk Based Analytic software on PNGRB, ASME and API pipeline integrity management standards and codes.
- Centralized database being developed to monitor action on removal of Encroachment for systematic follow-up with sites for removal of encroachment.
- Entire pipeline assets have been mapped on GIS platform complete with RoU details, Pipeline records and maintenance history to assist in integrity management of pipelines.
- Greater emphasis on suppliers to meet the quality specifications as per gas supply contracts and meeting PNGRB prescribed norms.





- GPS based online tracking system for foot patrolling implemented in Pipelines.
- Guideline for Stakeholder's Awareness reviewed in respect of identifying the target Audience, Key Messages of Communication, Communication Medium, Implementation and Responsibilities.
- Advertising through Radio Jingle has been started to increase awareness campaigns.
- Guidelines for Public awareness issued for Incentives to Farmers / Land owners for the protection of Markers & Test Stations are being finalized.
- GAIL's Sahyogi Scheme is an effort to engage and involve the villagers residing in nearby area of GAIL pipelines.
- Group SMS and voice telephony system implemented at all GAIL sites for faster communication during emergency.
- In order to have faster communication during any emergency, All India Toll-Free short key no.15101 has been started apart from existing 1800118430.
- Integrated Security Command and Control Center with CCTV surveillance in NCR Pipeline networks, deployment of Quick Response Teams to handle any emergency/exigency in pipelines.
- Auto Closure facility of valves in pipelines near city area. This will ensure that in case of any leak, burst etc. the valves will close automatically thereby reducing chances of further damage.
- Installation of Gas Dehydration Units at source locations where off-spec gas was being received in GAIL's Pipeline.
- Installation of On-line Moisture and Sulphur analyzers at all source locations to monitor the fluid quality being allowed in GAIL's pipeline.
- Pipeline repair criteria have been made more stringent than that recommended by Codes.
- Follow-up with district administration for removal of encroachments on pipeline ROU.

GAIL Energizes Nagaram Development

1. SKILL DEVELOPMENT UNDER GAIL Kaushal Program:

- a. Rs. 6 Crore spent under GAIL CSR Kaushal Program to established skill development institute - GAIL Institute of Skills at Nagaram in 2015 which is being implemented through IL&FS Skills in collaboration with NSDC. Under the initiative, various employable certificate courses such as Auto-cad, Industrial electrician, Pipe welding, Instrumentation technician courses are imparted. 430 students have been trained in Auto-cad course of which 70 % personnel have given opportunity for employment in various MNC companies.
- b. GAIL has constructed new building and installed state of art equipment's with cost of Rs. 1 cr. with a target of employable certificate program for 240 candidates for the FY 2017-18.

2. HEALTH CARE/MEDICAL CARE under GAIL Arogya Program:

- a. Rs. 36 Lacs worth Mobile Medical Van services provided to needy people of 25 Villages in and around of Nagaram, East Godavari Dist, AP. The weekly cycles of medical services is benefitting 25000 patients per annum. In addition, health camps are also organized.
- b. Rs.50 Lacs sanctioned to District Administration towards Medical equipment's to PHC, Nagaram and GHC, Razole

3. COMMUNITY DEVELOPMENT under GAIL Unnati Program: Invested Rs.1417.79 Lakh- for the following activities





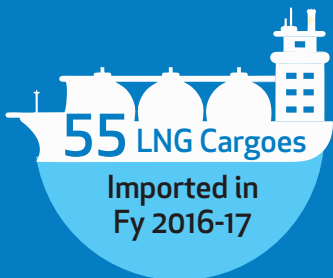
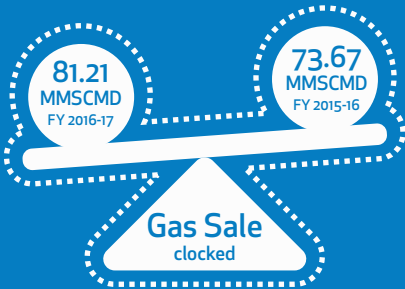
- a. Concrete road construction at 4 location at Nagaram.
- b. Construction of 4 rooms in ZPH School & Compound wall at Nagaram
- c. Providing bore well pumping main and Generator at Nagaram.
- d. Providing 400 LED Lights at Nagaram.
- e. Meritorious Students Scholarship ZPP, Nagaram & Govt. Jr. College, Razole
- 4. DRINKING WATER/SANITATION** under GAIL Arogya Program:
 - a. RO plant installed in Mamidikuru Mandal (Nagaram)
 - b. 4 Toilet units were constructed under Swachh Bharat Swachh Vidyalaya Abhiyan. Benefitting approx. 40000 School children in East & West Godavari Dists.
 - c. Rs.20 Lakh released to Dist. Administration for Replacement of Filter media for Quality Water supply to Mamidikuduru Mandal
- 5. WOMEN EMPOWERMENT INITIATIVES** under GAIL Sashakt Program:
 - a. Supported NGO for imparting training program on Non-Woven fabric cloths bas and screen printing works as the result benefitting 30 rural women at Nagarm.
- 6. GAIL CHARITABLE & EDUCATION TRUST:**
 - a. Rs.1.16 Lakh Scholarship every year has been disbursed to 30 meritorious students from 8th to 12th Std. from lower strata of society.
 - b. Rs.80 Lakh sanctioned to Dist. Administration, East Godavari District for construction school compounds wall in 9 Schools.
- 7. EMERGENCY NEED:**

Under Relief & Rehabilitation efforts at Nagaram, GAIL has taken corrective and proactive steps to bring relief to the affected families and villagers of Nagaram by means of:

 - a. Rs.20 Lakhs Compensation to next of kin of the deceased and Rs. 5 Lakhs to each of injured
 - b. Rs.2.4 Lakh financial Assistance provided to 24 Nos. of fire victims of all caste colony, Magatapalli Village, Mamidikurduru Mandal.
 - c. Rs 9.2 Crores contributed by GAIL towards R&R measures of Nagarm Village.
- 8. Other Development Activities in Nagaram of estimated Rs 95 lakhs**
 - a. Construction of Underground drainages & Market Sheds ; Improvement of Sanitation works



Business Growth and Profitability



Glimpses of GAIL's Make In India stall at Petrotech Exhibition Area



Business Growth and Profitability

India's growth momentum is expected to continue with economic reforms and higher growth targets. With factors such as of expanding economy, growing population, need for energy security coupled with the present scenario of import dependency and global climate concerns, GAIL as an integrated natural gas company, has a key role to play. GAIL, with presence across the natural gas value chain, and core business of natural gas transmission and marketing, can assume the vital role in shaping the country's future energy landscape as a cleaner alternative to fossil fuels. Natural gas can act as a bridge fuel towards achieving the goal of low-carbon economy for the future while also acting as a gap fuel for enabling consistency of renewable energy supply.



GAIL aims for quality service to customers and value creation for all its stakeholders so as to face the challenges of the economy. We firmly believe that environmental friendly business plays a vital role in social and economic development of the country and makes substantial contribution towards its energy security.

The external oil and gas dynamics in general and spot LNG availability and prices continue to remain a challenge to GAIL's profitability. Nevertheless, improved physical performance in Gas Transmission, Marketing segment and Petrochemical Segment coupled with lower operating and finance cost contributing to significant increase in profitability during the financial year ending March 2017. GAIL's efforts towards higher utilization of pipelines and plants and better tariff realization are key to sustainable growth in profit in the years to come in the long run.

Director (Finance)



GAIL's Economic Performance



We are engaged in gas transmission, production of LHCs and petrochemicals. We transport natural gas, imported LNG and LPG. We have about 11,507 Kms of NG Pipeline & 2,038 Kms of LPG Pipeline Network and uses gas as raw material for its LPG and petrochemical production. The Government of India owns 54.43% of our stakes. We supply to sectors including Power, Fertilizer, Steel, Refinery and even Household consumers. Apart from natural gas transmission, distribution and processing, we have diversified business interests in Petrochemicals, LPG transmission, City gas distribution and Exploration and Production activities.

In FY 2016-17, we registered a turnover of INR 48,789 Crore against INR 52,003 crore in the previous fiscal. The gross margin during 2016-17 stood as INR 7,287 Crore as against INR 5,172 Crore from the last fiscal year. The Profit Before Tax during the year was INR 5,411 Crore as against INR 3,062 Crore in the previous year.

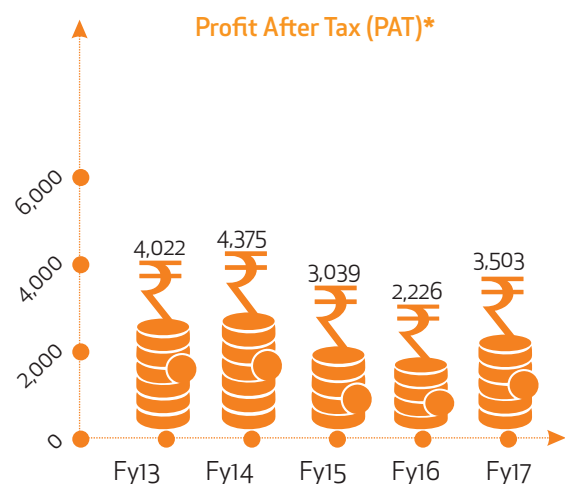
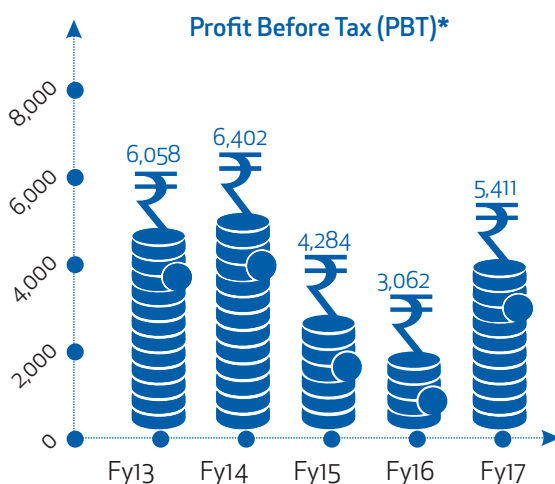
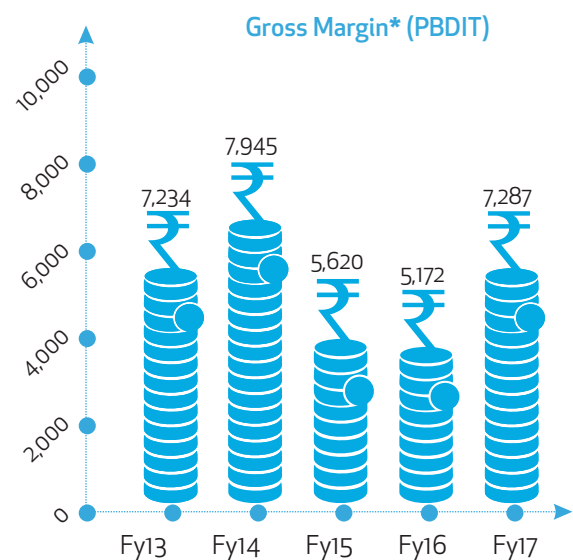
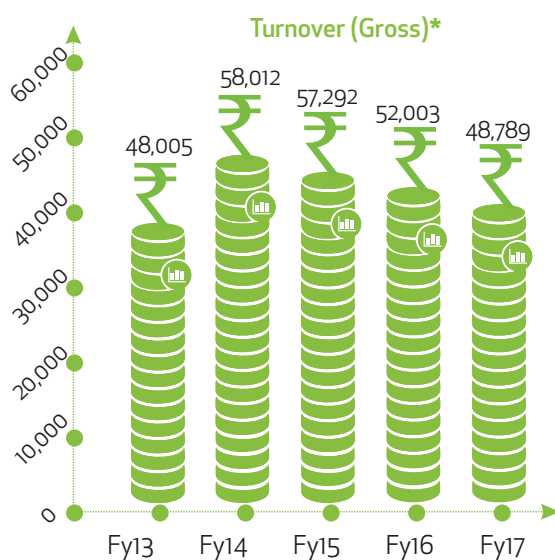
The Profit after Tax in 2016-17 rose to INR 3,503 crore from INR 2,226 Crore in the previous year.





The Board has recommended payment of final dividend @ 27% on equity share of INR 10 each (INR 2.70 per equity share on expanded equity post issue of Bonus shares i.e. INR 1691.30 Crores) for the FY 2016-17 amounting to INR 457 Crores.

During the year 2016-17, GAIL contributed INR 5909 Cr. towards dividends, duties, and various central, state and local taxes at corporate level and in all its operational regions. INR 450 Crore financial assistance has been received by GAIL for Urja Ganga Project from Government of India in FY 16-17. GAIL did not make any financial or in-kind contribution from CSR allocation to political parties. G4-EC4, G4-S06



During the year 2016-17, GAIL contributed INR 5909 Cr. towards dividends, duties, and various central, state and local taxes at corporate level and in all its operational regions. No financial assistance received from Government of India in FY 16-17. GAIL did not make any financial or in-kind

contribution to political parties, politicians or related institutions. G4-EC4, G4-S06

The major factors contributed in our performance of FY 16-17 are as under:-

- Decrease in cost of Raw Material and Fuel ~ INR 1600 crore

- Increase in Petrochemical Sales by 73% - Incremental Margin ~ INR 900 crore
- Natural Gas Marketing and Transmission volumes rose by 10% and 9% - led to incremental income of ~ INR 500 Crore
- Upward revision in Tariff of six pipeline Networks ~ INR 360 Crore





Parameter*(INR Millions)	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY15-16#	FY 16-17#
Economic Value Generated						
Revenues	4,11,745	4,83,572	5,88,153	5,78,555	5,26,233	4,98,306
Economic Value Distributed						
Operating Cost	3,54,411	4,10,176	5,17,312	5,18,271	4,17,317	4,73,215
Employee wages and benefits	7,208	10,674	9,082	10,608	10,741	13,537
Payments to providers of capital	14,352	17,240	20,368	14,983	15,399	19,873
Payment to Government	18,652	22,386	22,513	13,988	9,776	22,032

- Profit from stake sale in MGL ~ INR 489 Crore
- Increase in Dividend Income by ~ INR 110 Crore
- Decrease in Finance Cost by ~ INR 320 Crore
- Partial Impairment of investment in RGPPL ~ INR 783 Crore
- Decrease in Avg. LHC and Avg. Petchem Price by 5% and 4% respectively in FY17 vs. Fy16 ~ INR 400 Crore
- Fall in E&P Revenue ~ INR140 Crore

During the year 2016-17, as per consolidated financial statements, the total group sales (net of Excise Duty) stood at Rs. 49,297 crore and the Group PAT was Rs. 3,374 crore. CGD group companies (IGL, MGL, GAIL GAS) and PLL have continued to add to the group profit. However, ONGC Petro Additions Ltd (OPaL) and Brahmaputra Cracker and Polymer Ltd. (BCPL), are in its initial year of operation and under stabilization. The EPS as per consolidated statement was INR 19.95 per share as against INR 11.08 per share in the previous year.

Our MoU

GAIL signed its Memorandum of Understanding (MoU) with the Ministry

of Petroleum and Natural Gas, through which performance targets for the year were set with the thrust on critical aspects such as key financial parameters, gas marketing, gas transmission, project implementation, capital expenditure & polymer production etc. The performance rating as per the MoU of 2015-16 was ‘Very Good’. For 2016-17, the MoU score and rating is 98.02 with Excellent rating.

This “Excellent” rating has been achieved on the back of strong performance in its core business areas i.e. Gas Marketing & Gas Transmission; also excellent performance in Project execution & overall strong financial

performance which is reflected in profitability & other financial ratios. GAIL is executing projects of National Importance i.e. JagdishpurHaldiaBokaroDhamra pipeline (JHBDPL) & maximum spending of Capital Expenditure (Capex) in FY 16-17 has been for this project. The performance for FY 2016-17 is an example of pursuing National priorities of strengthening drivers of growth along the natural gas value chain.

Natural Gas Marketing

Natural gas transmission continues to constitute core business of GAIL.



On the to Occasion of World Energy Day, Ms. Sunita Narain, DG, Centre for Science and Environment , Mr. Subir Purkayastha, Director(Finance), GAIL, interacted with GAIL employees across India through Video Conferencing





MoU 2016-17: Performance

S.No	Criteria	Unit	Achieved	Rating
I. Capacity Utilization				
i.	Gas Marketing	MMSCMD	81.21	Excellent
ii.	Gas Transmission	MMSCMD	100.38	Excellent
iii.	Polymer Production (PATA I & II)	TMT	604	Fair
II. Efficiency Parameter				
A. Operational Efficiency				
i.	Installation and testing of Pipeline Intrusion detection system on trial basis for at least 01 section of LPG pipeline	Date	25-10-2016	Excellent
ii.	Return on investment from Operating JVs	%	11.65	Excellent
III. Technology Up-gradation				
i.	Implementation of Advanced Persistent Threat (APT) Mitigation Solution including formation of Security Operation Center (SOC)	Date	19-10-2016	Excellent
IV. Leveraging Network				
	Capital Expenditure (CAPEX)	Rs. Cr	1929	Excellent
V. Monitoring Parameter				
	Percentage of Value of CAPEX contracts / projects running / completed during the year without time / cost overrun to total value of CAPEX contract running / completed during the year.	%	100	Excellent
VI. Turnover from Operation				
i.	Revenue from Operations (Net of Excise duty)	Rs. Cr.	48149	Excellent
VII. Operating Profit/ Surplus				
i.	Profit/ Surplus before Tax or Reduction in Loss/ Deficit (excluding Other Income, Extraordinary and Exceptional Items) as percentage of revenue from operations (net of ED)	%	9.4	Excellent
VIII. Early Signs of Weakness				
i.	Reduction in Claims against the Company not acknowledged as debt, over the previous year – raised by CPSEs	%	94.37	Good
IX. Marketing Efficiency Ratios				
i.	Number of days of Inventory of finished goods and Work-in-Progress to sale of Products	No. of Days	7	Excellent
ii.	Trade Receivables as percentage of Revenue from Operations (Gross)	%	7.83	Excellent
X. Return on Investment				
A. Profit Earning CPSEs				
i.	Dividend / PAT	%	44	Excellent
ii.	PAT / Net Worth or Shareholders Fund	%	9	Excellent
iii.	Dividend / Net Worth	%	4.06	Excellent





Business Performance

In FY 16-17, the segment wise business performance of GAIL is as under:

During 2016-17, gas sales clocked 81.21 MMSCMD, compared to 73.67 MMSCMD in the previous financial year. The total domestic gas availability to GAIL for marketing remained stagnant at 48.5 MMSCMD while Long-Term imported volumes witnessed increased consumption vis-à-vis the previous financial year because of successful price negotiation with Ras-Gas, Qatar. The major supplies of natural gas include fuel to power plants, feedstock for gas-based fertilizer plants and LPG extraction.

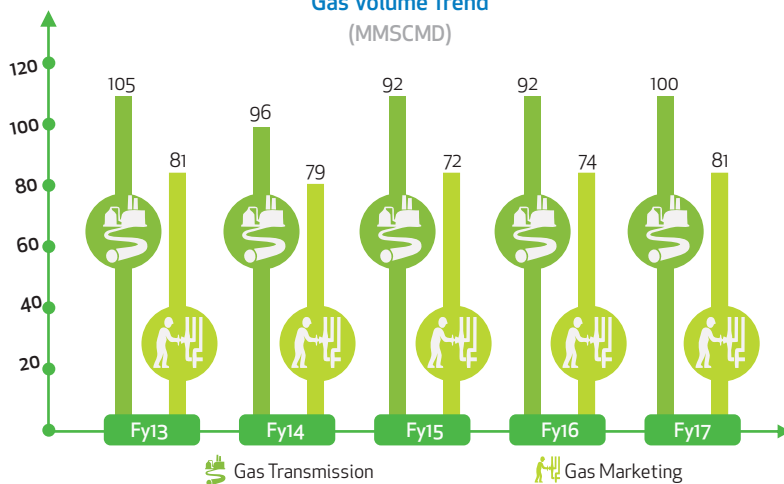
Our Supply Chain

Entrusted with the objective of building and operating natural gas

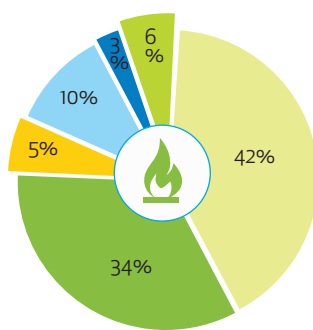
Our Gas business landscape is dynamic, the LNG landscape is witnessing rapid changes and GAIL is geared to respond to the changes through improving its marketing capability for portfolio trading, hedging, selling and contracting LNG internationally, as well as capabilities for managing shipping lines. GAIL has successfully completed Time Swap deals for a part of its US volumes and is also considering other innovative options for optimization its sales of US volumes.

Director (Marketing)

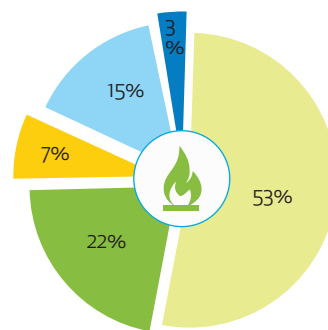
Gas Volume Trend (MMSCMD)



Gas Transmission Mix

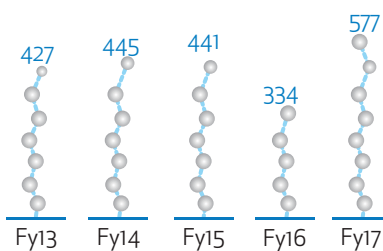


Gas Transmission Mix

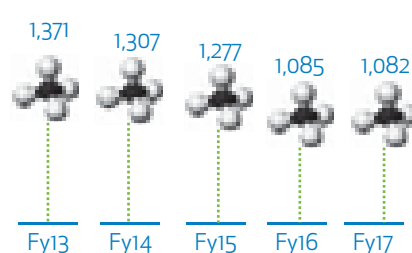


■ APM/NAPM ■ RLNG ■ PMT ■ Spot ■ Mid Term ■ RIL

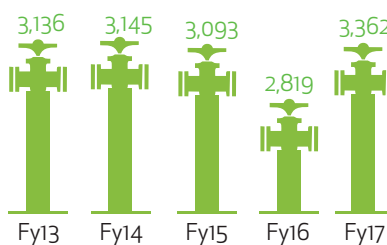
Petrochemicals Sales



Liquid Hydrocarbons Sales



LPG Transmission





infrastructure and working for energy security of the country, GAIL is India's largest natural gas company and is amongst the top gas utility companies in the Asian region. While working across the natural gas value chain including exploration and production, processing, transmission, distribution and marketing and related services, GAIL has dedicated business segment of production and marketing of Petrochemicals like HDPE and LLDPE.

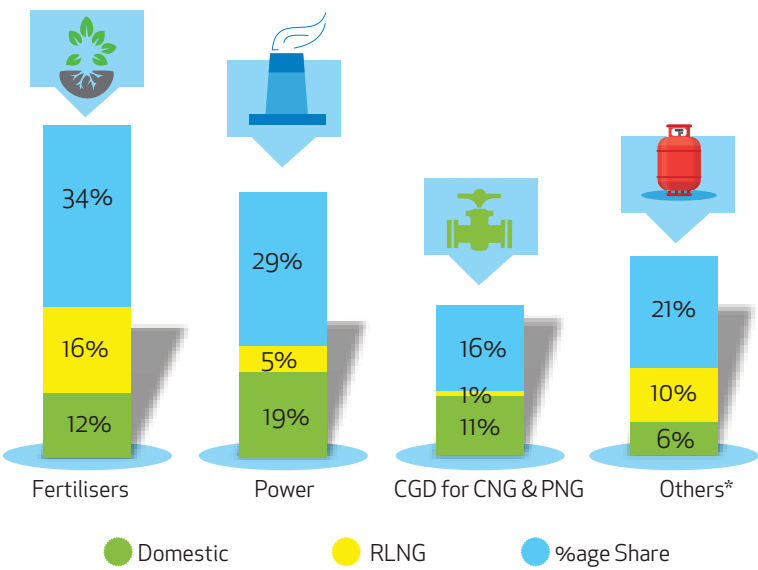
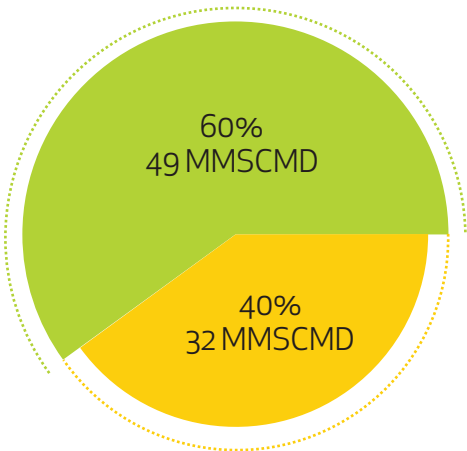
GAIL has expanded and strengthened its presence in LNG regasification, City Gas Distribution, and exploration and production through the routes of picking-up equity and forming joint ventures. GAIL's Supply Chain is of critical importance to its business because of reducing output from the domestic gas fields and increasing dependency on imports of Natural Gas. With a purpose to achieve sustainability in the supply chain, GAIL has implemented Public Procurement Policy for Micro and Small Enterprises (MSEs), DMEP (Domestically Manufactured Electronic Products) policy and has taken steps to develop local vendors in support of Make in India campaign. As a part of its resilient supply chain strategy, GAIL has enlisted local and global suppliers in its operations. While maintaining a close relationship with its suppliers, efforts are always taken to ensure reliability of raw materials supply, increase in efficiency, reduce risk and above all, maintain the safety of our operations.

Transmission Segment

A. Natural Gas

GAIL owns and operates a network of about 11000 Kms of natural gas high pressure trunk pipeline with a pan-India capacity of around 206 MMSCMD of natural gas. The average gas transmission during the year 2016-17 was 100.38 MMSCMD, compared to 92.09 MMSCMD in the previous

(MMSCMD, % share)



● Domestic ● RLNG ● %age Share

- Imported Gas primarily consists of Long Term RLNG, Mid Term RLNG and Spot
- Major sources for domestic gas are ONGC (APM & Non APM), PMT at APM & PSC prices, Ravva, Ravva satellite etc.
- Highest demand of Natural Gas from Power & Fertilizer companies

* Others include Steel, Refineries, Sponge Iron, Petrochemicals, GAIL Internal consumption etc.





financial year. The share of third party transmission was 22.18 MMSCMD.

• Fertilizer Sector

During FY 16-17, GAIL achieved total sales of Natural Gas (Domestic + RLNG) in the Fertilizer Sector of 28 MMSCMD against 25.43 MMSCMD in FY 2015-16. GAIL is in talks with upcoming/revived fertilizer units for supply of gas and it is expected that agreement for supplying gas shall be firmed up by end of 2017.

Gas pooling for Fertilizer sector - Cabinet Committee of Economic Affairs (CCEA) approved scheme for Gas Pooling in Fertilizer Sector on 31.03.2015. The scheme seeks to establish a mechanism for pooling the price of domestic gas and Re-gasified Liquefied Natural Gas (RLNG) for offering a uniform gas price to all the customers in Fertilizer Sector. GAIL has been appointed as the Pool Operator.

Benefits- Uniform price at the input stage has helped in the urea production of around 245 LMT, increasing Urea production by about 20 LMT during FY 2015-16 (YoY basis) on account of improved availability of feedstock (Gas) to the urea plants. The production in FY 16-17 is at same level.

• Power Sector

During FY 16-17, GAIL achieved total sales of Natural Gas (Domestic + RLNG) in the Power Sector of 23.81 MMSCMD against 24.10 MMSCMD in FY 2015-16. The PSDF (Power System Development Fund) Scheme of Ministry of Power for the gas based power sector continued

during FY 16-17 and GAIL as Pool Operator supplied around 4.0 MMSCMD of incremental RLNG to gas based power plants which is included in the total sales to the Power Sector. The Scheme expired on 31st March 2017 and GAIL continues to explore opportunities for supply of natural gas to gas based power generation units at affordable

B. LPG

GAIL is the only Company in India, which owns and operates exclusive pipelines for LPG transmission for third-party usage. with a total length of 2038 Kms. Out of this, 1415 Kms of pipeline network transports LPG from the western to the northern parts of India (Jamnagar - Loni pipeline) and the balance 623 Kms of pipeline network transports LPG to the country's southern part (Vizag-Secunderabad pipeline). The LPG transmission system has a capacity to transport up to 3.83 MMTPA of LPG. In 2016-17, the LPG transmission throughput achieved was about 3.36 Million MT compared to 2.82 Million MT in the previous financial year. The two LPG Pipelines of viz. Vizag-Secunderabad Pipeline (VSPL) and Jamnagar-Loni Pipeline (JLPL) are both operating on full capacity; the design capacity of JLPL is being augmented from existing 2.5 to 3.25 MMTPA which is expected to be commissioned by end Mar'18. There is a spurt in LPG demand / consumption in the country during recent years, driven by its strong potential as a clean, environment friendly, portable and affordable fuel and further boosted by a strong impetus from the Govt. of India to widen its reach and market to hitherto virgin territory. Our country is deficit of LPG and almost 60% of the

total LPG demand is presently being met through imports. Thus, there is a huge potential for absorbing enhanced LPG production of GAIL, and with the recent availability of additional rich gas from ONGC's new Daman Field, GAIL has been able to increase LPG sales by about 15 - 20 % and expect this trend to continue in future also.

C. Petrochemical Marketing

GAIL owns & operates petrochemicals complex at Pata, district Auraiya (UP), with nameplate capacity of 8.10 Lakh MTPA of polymers, which was recently enhanced from 4.1 lakh MTPA by commissioning a new petrochemical plant of 4.0 lakh MTPA capacity. This new plant produced 1.5 lakh MT of polymer in its first year of operation. The overall production of polymers in 2016-17 was 6.04 lakh MT.

During the year, we achieved sale of 5.77 lakh MT of polymers, which is highest ever sales with estimated Sales Turnover of INR 5676 Crore. Also, we started exports of polymers and sold 14,249 MTs during the year. GAIL's petrochemical segment turned profitable from PBT of INR (-1,155) crore in FY 2015-16 to INR 216 Crore in FY 2016-17.

Our petrochemical business has doubled its capacity with Pata II and BCPL coming on stream. Focus will be now to strengthening our petrochemical trading capabilities in India and neighbouring countries, to enable us make it a major contributors to our bottom line.

Director (Marketing)





D. LPG and Other Liquid Hydrocarbon Production

GAIL has LPG plants at five locations in the country having a production capacity of 1.3 million MT of LPG and other liquid hydrocarbons. The Usar LPG recovery plant is currently under the preservation mode due to non-availability of domestic gas.

In 2016-17, total liquid hydrocarbon production was about 1.11 Million MT, which included 0.86 Million MT of LPG, 0.13 Million MT of Propane, 0.04 Million MT of Pentane and 0.08 Million MT of Naphtha. GAIL has also marketed about 13 thousand MT of Liquid Hydrocarbon products produced by BCPL during the year.

Other Liquid Hydrocarbon (LHC) products of GAIL such as Propane, Naphtha, Pentane, Propylene etc. market is available to absorb even higher quantum of these products if made available in future.

Further, GAIL is also exploring the possibility of setting up 60 KTA PP plant at Pata and a 500 KTA Propane Dehydrogenation & Poly Propylene (PDH-PP) plant at one of its units. The major challenge with respect to LHC marketing is that the landing cost of LHC products are higher. To mitigate wherever possible logistics discounts are introduced.

E. Exploration and Production (E&P)

E&P investment were initiated with the objective of enabling GAIL to be integrated oil and gas major with presence in upstream, midstream, and downstream segments of oil and gas value chain. Apart from securing sources for Natural Gas, strategic reasons to get into E&P included

- (i) National Gas security
- (ii) Diversification of Business portfolio
- (iii) Global opportunity through acquisition of overseas assets

As a result of continued portfolio optimization, GAIL now has participating interest in 12 E&P blocks of which 10 blocks are in India and the remaining two blocks in Myanmar. Out of these, GAIL is Operator in one onland block namely CB-ONN-2010/11 in Cambay basin awarded during the NELP-IX bidding round.

Drilling activities continued in four (out of five) blocks obtained during the NELP-IX bidding round. Hydrocarbon discoveries have been notified to the government in two blocks namely GK-OSN-2010/1 and CB-ONN-2010/8. Survey activities are in progress in the remaining NELP-IX block AA-ONN-2010/2 (Operator: OIL)

The E&P business has continued to be revenue self-sustainable for the third consecutive year due to revenues from four blocks (two overseas blocks in Myanmar and 2 domestic blocks in the Cambay basin). Revenue of approximately Rs. 615.28 crores was generated from the sale of hydrocarbons from four producing blocks namely A-1 & A-3, Myanmar and CB-ONN-2000/1 and CB-ONN-2003/2 (Cambay onland) during the year 2016-17. Portfolio of upstream asset is continuously reviewed to maintain sustainability and risk profile of investment.

Natural Gas Sourcing & Marketing

GAIL's key sources for domestic gas are - ONGC: Administered Pricing Mechanism (APM) and Non-APM, PMT at APM and Production Sharing Contract prices, Ravva and Ravva Satellite, etc. To enhance the security

of long term supplies of the natural gas for the country, GAIL has contracted long term gas supplies through imports of Long term and mid-term RLNG and Spot purchases. We have signed long term LNG supply contracts for 3.5 MMTA with Sabine Pass Liquefaction LLC, USA and 2.3 MMTA with Dominion Cove Point LNG, USA. Keeping in mind the dynamics of this global commodity, we have successfully re-negotiated prices for 55 Master Sales Purchase Agreements with all reputed LNG suppliers.

Natural gas trading constitutes 70% of the business turnover and continues to be GAIL's core business. During FY 2016-17, gas sales clocked 81.21 MMSCMD, compared to 73.67 MMSCMD in the previous financial year. Domestic gas availability remained stagnant at 48.5 MMSCMD while Long-Term imported volumes witnessed increased consumption vis-à-vis the previous financial year. Consumption of gas by CGD sector at 20 MMSCMD emerged to be the fastest growing segment.



A view of GAIL's E&P operations



The challenges prevailing for us in terms of gas marketing are that there is lack of connectivity with National Gas Grid/Major trunk pipelines in Cauvery Basin, reduction in domestic supplies in the region and compatibility vis-à-vis liquid fuels in the background of fall in crude price. To mitigate these

challenges we have taken up Kochi – Bangalore Mangalore Pipeline (Ph-II) Project which is under execution.

TAPI Project - In April 2016, an Investment Agreement (IA) relating to initial equity infusion by the TAPI entities into TAPI Pipeline Company

Limited (TPCL) has been signed. TPCL has engaged a consultant for providing Project Management and FEED Consultancy Services for the pre-FID phase. In January 2017, TPCL formally signed the contract agreement with the consultant in Turkmenistan.

Initiatives for Future Growth

Sustainability of business is imperative for any organization. GAIL as a responsible organization believes in taking strategic initiatives with align with our business goals, aspirations and Vision that ensures sustainable and responsible economic growth.

A. Petrochemicals

In order to establish GAIL as a significant petrochemical player, especially in Asia, focus was given to develop export capability. GAIL exported 14,000 MT of polymers as a step in this direction. GAIL along with Hindustan Petroleum Corporation Limited (HPCL) is carrying out various studies for setting up a Greenfield Naphtha/Ethane based petrochemical complex in Andhra Pradesh. The project is estimated to cost approximately Rs 40,000 crores.

B. Renewables

It's our endeavour to decrease our carbon footprint and contribute towards a low carbon economy. As a step in this direction, we have installed 118 MW wind energy capacity and has also set up a 5 MW solar project with a Gross Block of INR 819.35 crore. The grid connected roof top solar power plant located at Petrochemical Complex, Pata, is targeted to be complete in FY 17-18. Further, GAIL is exploring the possibility of setting up additional facilities for captive use and setting up new solar projects through bidding route. Also, there has been a growth of 43% in the revenue from the wind energy.

C. Natural Gas Pipeline Projects

During the financial year, GAIL has completed 14 pipeline projects including Last mile connectivity of approximately 437 kms, to harness the commercial utilization of various pipeline networks in the states of Karnataka, Gujarat, Goa, Haryana, Rajasthan, Maharashtra and Punjab.

D. Coal Gasification

GAIL is also entering into coal gasification by setting up surface coal gasification based urea project at Talcher, Dist. Angul Odisha through a JV company namely "Talcher Fertilizers Ltd.". The JV has been formed with consortium partners namely GAIL, Coal India Limited (CIL), Rashtriya Chemicals and Fertilizers (RCF) (each having a stake of 29.67%) and Fertilizer Corporation of India Limited (FCIL) (10.99% equity). The JV Company will be the First Coal Gasification plant for production of ammonia/urea in India. The project, with an estimated cost of Rs.11611 crores is envisaged for the production of 2200 MTPD ammonia and 3850 MTPD urea. The success of this project would pave the way for the production of fertilizers from the abundantly available domestic coal, thus resulting in lesser dependency on their imports. The JV Company has shortlisted technology licensor for coal gasification.



R-LNG Regasification Terminals and Shipping

India is one of the largest importer of LNG. Currently, India has the infrastructure to annually import and regassify 25 MMTA of LNG through the four terminals (Dahej, 15 MMTA; Hazira, 5 MMTA; Dabhol, 5 MMTA; and Kochi, 5 MMTA) established on the west coast. However, the actual import capacity is less due to lower utilization of the Kochi and Dabhol terminals because of pipeline connectivity issues and incomplete marine facilities. Setting up LNG regasification terminals and booking re-gas capacities is a part of GAIL's strategy to develop sustainable supply chain.

Last year, GAIL imported 55 spot/ mid-term LNG cargoes as compared to 75 cargoes being imported in the four-year period of 2011-15. GAIL also participated in the RGPPL 5 MMTA Regasification Facility at Ratnagiri, Maharashtra.

Considering the various LNG tie-ups made by GAIL, which are expected to commence supplies from 2018 onwards, access to the Dabhol LNG terminal of RGPPL provides greater operational flexibility to GAIL in LNG

business. During the financial year, 15 LNG cargoes were unloaded at the Dabhol Terminal. This terminal is ideally located with ready access to an extensive network of gas infrastructure for distribution to high demand western and upcoming southern markets. Further, the construction of breakwater will assure that the terminal is operational throughout the year in its full capacity.

RGPPL is working with all stakeholders for its long-term viability, which includes demerger of LNG terminal and power block assets to enable restructuring under the revised RBI norms which will enable availability of funds for the construction of breakwater and other facilities to achieve the full potential of the LNG terminal and loan restructuring to keep both assets viable. RGPPL will retain the Power Block and a new Company, M/s Konkan LNG Private Limited (KLPL) is formed and after demerger, the LNG Terminal will be owned and operated by KLPL. The Power Block is presently running and daily average generation is 500 MW and power is supplied to the Railways in the state of Gujarat, MP and Maharashtra & Jharkhand. During FY16-17, Power Block supplied 4260 Million Units to Railways under PSDF (Power System

Development Fund) Scheme. Stakeholders (Shareholders and secured/unsecured creditors) gave their consent for demerger scheme in High Court. Final hearing on Scheme of Demerger was taken up for hearing by the National Company Law Tribunal (NCLT) on 29.06.2017.

Given the backdrop of India's growing LNG import dependence, owning gas equity assets will help GAIL in dealing with price risks in a superior manner. We have contracted gas supplies to put in place a diversified long-term import portfolio from Qatar, Australia, USA, Russia and Turkmenistan through multiple LNG and transnational pipeline deals to meet the ever-increasing demand for natural gas in India. These deals signify our commitment towards developing the Natural Gas based economy.

GAIL or its affiliates have also traded some of the LNG portfolio in international market, in line with globalisation strategy and also for calibrating domestic market supplies. It is also focusing on making upstream investments in gas assets and LNG shipping to build a presence across the entire LNG value chain. This will enable GAIL for creating flexibility in providing better value to its customers.

Onshore Regasification Terminal at Dhamra Port

Dhamra LNG Terminal Private Limited (DLTPL), a wholly owned subsidiary of Adani Petroleum Terminal Private Limited (APTPL) is developing a 5 MMTA LNG regasification terminal at the Dhamra Port in Odisha. GAIL and IOCL have entered into MoUs with DLTPL for booking of 1.5 MMTA and 3.0 MMTA of regasification capacity in the terminal as well as for equity participation of 11% and 39% in DLTPL respectively. Tolling Service Agreements (Regasification Agreement) are in advanced stage of finalization while due diligence for equity infusion is underway. The objective of participation in Dhamra LNG Terminal is that the regasified LNG from the Project can be transported readily with the availability of downstream pipeline. Promoting the LNG regasification terminal and laying of the Dhamra-Dobhi leg of JHBDPL will serve the two fold purpose of ensuring disposal of LNG from GAIL's portfolio as well as utilization of the pipeline and getting broader market access in the region to capture additional gas demand.





LNG Supply Chain

GAIL is importing LNG through various international LNG suppliers on spot / short term basis and all LNG imports are considered to be high value commodity. Accordingly all the suppliers are equally critical and

important for supply of LNG due to its high value contractual commitments. Apart from this GAIL also purchase RLNG from domestic supplier from time to time and all the RLNG Suppliers are considered to be under critical Tier 1 Supplier due to high value commodity to be purchased and with limited

availability. The top five priorities of the supply chain management are sourcing of LNG, loading of LNG at Load-port, transportation/ Shipping, unloading at Discharge port and re-gas at Re-gas terminal and transportation of RLNG, delivery to Battery Limit and marketing of RLNG to downstream customers at most competitive price.

City Gas Distribution

In order to provide clean fuel for domestic, vehicular and commercial use and to facilitate development of smart cities, GAIL plans to expand its city gas distribution network. GAIL Gas Limited, a wholly owned subsidiary of GAIL, is implementing CGD projects in the cities of Kota, Dewas, Meerut, Sonapat, Bengaluru & Taj Trapezium and through its JVs in Haridwar, North Goa & Vadodara. Further, as a part of the Urja Ganga Project (JagdishpurHaldiaBokaroDhamra pipeline Project), GAIL shall on its own or through its subsidiary also implement CGD in six new cities in eastern India. CGD in Kolkata shall be operated through our JV. GAIL through its Subsidiary and JV companies own over 63% of the CNG stations and has 50% share of the domestic PNG connections. Consumption of gas by CGD sector in FY 16-17 at 20 MMSCMD emerged to be the fastest growing segment. In Bengaluru, GAIL Gas has laid 42 KM of steel Pipeline and 245 KM of MDPE Pipeline network. 19,370 Domestic customers have been connected during the financial year. GAIL Gas also commissioned 3 CNG station in Bengaluru and commercial operations has started at 1 CNG station. Further, 10 CNG stations are planned in FY 2017-18.

- PNG- As on 30.11.2017, approximately 39.22 lakhs households are getting benefited from PNG connections in India. Out of the 39.22 lakhs PNG (D) connections, 22.09 lakhs PNG connections (56.32%) have been provided by GAIL CGD JVs / Subsidiaries. Households in rural/remote areas are getting benefitted from the LPG connection thus freed.
- CNG Stations and vehicles- GAIL is supplying to approximately 65.30% CNG stations of the total 1282 CNG stations and approximately 65.94% CNG vehicles of the total 29.66 lakhs CNG vehicles in India as on 30.11.2017

Cumulative CGD Data till FY 16-17

S. no.	CGD Entity	IGL	MGL	MNGL	CUGL	GGL	AGL	BGL	TNGCL	GAIL Gas	Total
1.	Operating in Geographic areas	Delhi, Noida & Greater Noida, Ghaziabad	Mumbai, Thane & Contiguous areas	Pune	Kanpur, Bareilly	Agra, Lucknow	Indore (incl. Ujjain), Gwalior	Hyderabad, Vijaywada, Kakinada	Tripura	Sonapat, Meerut, Dewas, Kota, TTZ, Bengaluru	
2.	No. of Domestic PNG Connections	742206	948892	50851	19333	16200	12658	6608	28669	34677	1860094
3.	Industrial Connections	932	62	129	51	8	75	5	50	498	1810
4.	Commercial Connections	1816	3218	169	177	23	58	59	354	58	5932
5.	CNG Stations	421	203	42	18	19	22	41	6	16	788
6.	CNG Vehicles	892319	545505	140378	56599	41318	22190	39246	9103	22882	1769540





Advantages of CNG vehicles over Diesel vehicles

- CNG vehicles are more environment friendly in comparison to BS – IV compliant diesel vehicles due to lesser Sulphur content, lower NOx emissions, lower carbon dioxide emissions, lower visible PM/ black soot and greenhouse gas emissions.
- CNG vehicles increase life of lubricating oils as CNG does not contaminate & dilute the crankcase oil.
- In CNG vehicles, there are no fuel losses from spills or evaporation as CNG fuel systems are sealed.

CNG buses are more economical than diesel busses in the long term. A cost benefit analysis between new BS IV compliant diesel buses and CNG buses shows that new CNG busses save approx. 12% of cost in long term.

Urja Ganga

With the aim to energize India with cleaner alternative fuel i.e. Natural gas and expand the National Natural gas Grid to eastern India, “PradhanmantriUrja Ganga Pipeline Project” has been undertaken by GAIL. The 2540 Km pipeline project shall pass through the eastern part of U.P., Bihar, Jharkhand, Odisha and West Bengal. Urja Ganga would create enabling infrastructure for city gas distribution (CGD) in seven cities — Varanasi, Bhubaneswar, Cuttack, Kolkata, Patna, Ranchi and Jamshedpur. The project is scheduled to be completed by December 2020.

This pipeline shall supply gas to fertilizer plants at Gorakhpur, Barauni and Sindri. The pipeline shall have two gas sources one at Phulpur (Allahabad, U.P.) and the other at Dhamra RLNG Terminal (Odisha). The capacity of the pipeline network is 16 MMSCMD.

Of the total project cost of INR 12490 Crore, forty per cent of the total project cost i.e. Rs 5,176 crore would be provided as budgetary support, making it the first time the government — which wants the gas-deprived eastern parts of India to contribute to a reduction in carbon emissions — is paying for such a project.

This trunk pipeline investment could trigger cascading investments towards infrastructure creation in City Gas Distribution, LNG terminal, fertilizer plant revival etc. amounting to over INR 50,000 crore in the near future. This also is an endeavour to increase the proportion of gas in the country's energy mix to 15% from the present 6.5%.

Jagdishpur-Haldia-Bokaro-Dhamra Pipeline (JHBDPL) project

Section 1	Section 2	Section 3
Phulpur (UP)-Dobhi with spurlines to Varanasi, Gorakhpur, Patna and Barauni	Dobhi-Durgapur & Dhamra-Angul with spurlines to Sindri, Durgapur, Bhubaneswar, Cuttack, Paradip & Jamshedpur. Sections 2 & 3 are being executed simultaneously	Bokaro-Angul-Durgapur-Haldia with spurlines to Ranchi, Rourkela, Sambalpur, Jharsuguda & Kolkata

URJA GANGA

To cater to 5 eastern states (40 districts and 2,600 villages)

City Gas Distribution (CGD) to 7 cities

Completion date : December 2020

Project cost :

₹12,940 crore





Profitability Initiatives

Project Profit Maximization (Sanchay)

To address challenges such as to sustain profitability due to external factors like volatility in gas business, domestic gas volumes, changing oil & gas prices and prices of petrochemical/LHC etc. Hence, a comprehensive initiative was launched under “Project Sanchay” across all the business segments of the organization to optimize existing resources, improve operational and process efficiencies, reduce costs and maximize profitability. Extensive evaluation of business processes along the length and breadth of the Company were conducted to identify potential opportunities to maximize profitability. Various initiatives were identified and implemented, while some long-term initiatives are under various stages of implementation. Benefits from the implemented initiatives under Project Sanchay have been more than the targeted values.

Improvements in Financial Management Practices

- Centralized Marine Insurance Policy has been taken thereby reducing the marine policy cost and site-wise excess and shortages.
- Prepaid existing high cost term loans of INR 970 crore from Oil Industry Development Board (OIDB) towards saving in finance cost.
- Refinancing of US\$ 300 Million SMBC Loan (~ INR 1,950 Crore) has been done in FY17 which will result in saving in Interest ~ INR 37 Crore in next 2 years.
- First Ever Commodity Hedging Transaction executed towards internal consumption of Pata. Further cost of production reduced to the extent of USD 1.2 million on account of hedge transactions performed for Pata during FY 16-17.
- Forward cover of approx. USD 66 million booked towards repayment of foreign Currency Loan under natural Hedge mechanism

CHAPTER

8

Public Policy and Advocacy

Tajmahal
"Swachh Iconic Place"



Urja Ganga



Covering
40 districts &
2600 Villages





Public Policy and Advocacy

India has entered a major transformational phase in its economic- social and climate change goals. India will continue to be one of the fastest growing energy markets in the world. The Government of India (GoI) has focused on policy development across the value chain which will strongly facilitate shift to a gas based economy.

We interact regularly with PNGRB, the regulatory body, to update them on status and industry viewpoint. This aids in the advancement of our business strategies and goals and to achieve supportive government environment. We are a Public-Sector Enterprise and provide formal and informal feedbacks to various government bodies like MoPNG, PPAC, OISD, PCRA etc. on regular basis. This forms a significant basis for advancement of public good. We have extensively leveraged all channels to create mass scale awareness about the benefits of using natural gas. Our Hawa Badlo campaign resulted in creating awareness amongst large masses across the nation.

In addition, we are part of various prestigious industry bodies and associations which provide a platform to discuss industry issues and convey the industry voices to the government in a collective way to make better inclusive policies and bring reforms. This forms a significant basis for advancement of public good.



Government and Regulatory Agencies

Being a Central public-sector enterprise, we are committed to ensure not only long-term profitability but long term stable relation with all our stakeholders. Being guided by our vision statement, we uphold trust and ensure value creation for all our stakeholders. We are directly accountable to the Government of India as it is one of our key stakeholders with 54.43 % of shares. We keep the Government involved and updated about our performance and related events. Transparency and information sharing regarding our business, governance, financial and non-financial performance, and prospects is maintained and regularly updated for them.

Our focus remains on maintaining long-term cooperative relationship with regulators on broader socio-political concerns rather than just individual



A view of display of Pradhan Mantri Uja Ganga at GAIL's Stall at leading Exhibition





concerns. This also acts as a risk management and mitigation strategy as the concerns are considered both at macro and micro level and other ministries of Government of India. We also hold discussions at regular intervals and maintain close coordination with MoPNG and other regulators. We engage with MoPNG regarding Parliamentary questions, Parliamentary references, and Parliamentary Committee meetings. We also maintain close coordination with officials of Lok Sabha Secretariat / Rajya Sabha Secretariat regarding various communications and meetings of Parliamentary Committees.

Government of India initiated new

policies to attract investments in the gas sector so that domestic production can be increased. Few key policy initiatives are:

1. 100% allocation of domestic gas for CNG and PNG
2. Auction based E-Bid RLNG mechanism for utilization of stranded gas based power generation capacity
3. The amendment in Central Sales Tax Act 1956 will enable interstate sale of gas through common carrier pipeline on deemed movement basis. This will reduce the delivered cost of gas to customers
4. Marketing and Pricing freedom for new gas production from Deep / Ultra Deep water and High Pressure-High Temperature Areas.
5. Hydrocarbon Exploration Licensing Policy, HELP: An innovative Policy for future which provides for a uniform licensing system to cover all hydrocarbons such as oil, gas, coal bed methane etc. under a single licensing framework.
6. Policy for grant of extension to the Production Sharing Contracts for small, medium sized and discovered fields

A case for Natural Gas Based Economy

Background

India is the 3rd largest consumer of energy in the world. The economic development coupled with growing population has resulted in increased consumption of primary energy resources such as coal, crude oil and natural gas in India. During 2009-2016, the country's primary energy consumption grew at a CAGR over 4% to reach 724 MTOE. However, the share of natural gas in India's primary energy mix declined from 10% in 2009 to 6% in 2016, mainly due to a sharp drop in domestic supplies. Globally, while natural gas provides 24% of the energy supply, in India, the share of natural gas is a nominal 6%.

Power, Fertilizer, CGD, Refineries and Petrochemicals are the key gas-consuming sectors. Govt. of India has a vision to make India a gas based economy and for this share of gas needs to be increased substantially from present level of 6.2% in overall energy mix of the country. But to boost gas demand and the competitiveness in India, reforms need to be introduced in the gas sector.

1. Air Pollution

According to a report published in 2016 by WHO, half of the world's 20 most polluted cities are in India indicating industrial and vehicular exhaust were choking large parts of the country. Air pollution is a national problem and to win the fight against it, we need to act as a country and across city or even regional boundaries. At GAIL, a number of initiatives are being taken in support of curbing air pollution.

• Thermal Power sector

India's power sector, based predominantly on coal-fired plants, is one of the most polluting sectors of Indian industry. Coal based power accounts for ~58% of the current power generation capacity. Due to the use of poor quality coal by Indian power sector the pollution challenges are huge. Coal is the fuel of choice as it is plentiful and easy to mine, it provides reliable and dispatchable power. Land and water is provided at low costs; pollution norms are not stringent, finally, costs such as health impact and environmental damage, called externalities, are left out of the tariff calculations. These make electricity from coal highly "affordable".





A recent study by IMF (Getting Energy Prices Right: From Principle to Practice, 2014) has estimated total cost of pollutants (NO_x, SO_x and PM) for more than 150 economies around the globe.

As per the report, Indian system incurs additional cost of USD 5,683 from per ton of NO_x emissions, USD 7,833 from per ton of SO_x emission and USD 5,636 from per ton of PM emission from coal fired power plant (in 2010 USD as base year).

This cost can be used to determine the total cost of dispatch of coal fired power plant. If this cost were to be included for coal fired power plants, their average dispatch cost would increase at least by INR 2.30/kWh. When compared with gas based power plants, health impact from gas based power plants are less than INR 0.25/kWh primarily because of very low PM, NO_x, and SO_x emissions.

In a similar study done by ADB, "Valuation of Health Impacts of Air Pollution from Power Plants in Asia: A Practical Guide", it was concluded that in absence of abatement measures, the hefty cost of pollution on society is 12.58 cents/KWH (~Rs. 8.2/KWH).

Way Forward-In spite of gas based power capacity being very efficient in heat rate factor and compliant on environmental norms, due credit has not yet been given to the fuel in power and other sectors. Currently, out of 25 GW of installed gas based capacity, around 14 GW capacities is stranded and remaining capacities (~10 GW) are grossly underutilized. Earlier PSDF scheme of GoI added 1200 MW of gas based power to the grid from additional 5 MMSCMD of gas with a net outgo of around Rs. 1430 Cr. only against CCEA approved outlay of Rs. 7500 Cr. GAIL played an important role in this scheme and was the pool operator. The scheme was discontinued in March 2017. Reintroduction of the similar scheme can help in utilization of stranded gas based power plants, thereby supplying cleaner power in the country.

The Supreme Court of India in October 2017 banned the use of petcoke in Delhi-NCR and adjoining 3 states (Rajasthan, UP & Haryana) in an effort to clean the air in one of the world's most polluted cities. The Supreme Court requested all States and Union Territories to move forward towards a nationwide ban on the use of pet coke and furnace oil to power up industries, in a bid to fight pollution.

❁ Implication of polluting industrial fuels like Petcoke & FO

India is the world's biggest consumer of petroleum coke, better known as petcoke. Furnace Oil (FO) & Pet-coke are highly polluting fuels with very high levels of Sulphur besides significant concentration of various metals. FO has between 15,000- 23,000 ppm and pet coke between 69,000 to 74,000 ppm of Sulphur. Burning of the pet coke poses a significant health risk due to emissions of high concentration of various air pollutants. Petcoke is classified as refinery by-product which allows it to be excluded from the rigours of various environmental regulations, completely ignoring its dangerous health effects when used as industrial fuel. It is comparatively cheaper than the coal because of the advantage of very high calorific value. Import of Petcoke accounts over 50% of India's consumption and is expected to grow year on year with curbs of its usage in USA and increasingly so in China.

The proposed fuel quality for Gasoline & Diesel restricts maximum allowable Sulphur as 10 ppm to meet Bharat Stage VI specification. Oil PSUs are going for a huge investment for BS VI auto fuel. But polluting fuel like Petcoke & FO are continuing to damage the environment through SO_x emission. It will be crucial to stop using Petcoke & FO as fuel in the country to get the full fruit of the investment for BS VI.

Way Forward-GAIL has vast network of gas pipeline in India. Most of the industries using these fuels can switch over to Natural Gas depending on the availability of gas pipeline infrastructure. GAIL has the necessary infrastructure for supplying gas to these industries.





When burned, natural gas releases up to 50% less CO₂ than coal and 20-30% less than oil. When used in power generation or as a transport fuel natural gas results in negligible emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), mercury (Hg), and particulates compared with other fuels. The increased use of natural gas offers a significant contribution to improved local air quality and public health.

Considering the life cycle impact on environment and health, Natural Gas is much more benign fossil fuel when compared to coal and liquid fuel. Unlike coal, natural gas does not require huge amount of water for its purification and it does not contaminate the ground water. Further, it is either transported through pipeline as gas or closed cryogenic vessel as liquid and therefore does not contaminate air during transportation. Difference between the emission level of pollutant & greenhouse gas from entire life cycle of Coal & Gas based power plant is huge and Gas based power plant has significant advantage over coal based plant.

2. India's commitment to Nationally Determined Contribution (NDC)

Under Paris accord India has pledged to reduce emission intensity of GDP by 33% to 35% with reference to 2005 levels. India is implementing one of the largest renewable energy programs to achieve 175 GW of renewable capacity by 2022. However, most of these supplies from renewable energy sources are variable and uncertain owing to the daily and seasonal variations. Integration of RE capacity into the system and maintaining reliability poses as a serious challenge.

Way Forward- Natural gas, with its low emissions and reliable supply, can help balance the grid and achieve a greater degree of grid integration for renewable energy sources. Further, Gas based turbine can quickly be ramped up and ramped down based on the demand of power and therefore derives advantage when integrated with renewable power. In view of the low-carbon goals of the country, natural gas is the right choice for integration with renewable energy. It is estimated that, Indian power system would require ~55 MMSCMD of gas to integrate 175 GW of RE by 2022. Almost 14 GW of Gas based capacity is stranded and remaining 10 GW is running with a very low PLF. These gas based plant have potential to play the role of grid balancing and intermittency need of the RE integration. This Renewable-Gas model can help to mitigate country's pollution problems as well as to meet NDC goal.

Need for suitable policy for the growth of Gas Sector:

In view of its environmental benefits of Natural Gas, globally, the developed countries have transitioned or are moving towards a gas based economy. With shale gas boom in the US and consequent increase in natural gas supply globally, India has a unique opportunity to increase share of gas in primary energy mix.

Some of the current challenges of Gas Sector in India include - insufficient domestic gas availability to meet the potential demand, uncertain Spot International LNG prices, price sensitive Indian market, lack of liquidity/ markets etc.

For transition to gas based economy and to rapidly meet the country's Intended Nationally Determined Contribution pledge of improving the carbon emission intensity of its GDP by 33 to 35% by 2030 from 2005 levels, suitable action plan involving incentivized thrust on domestic production, conducive policy and regulatory framework and an overhaul of the duties and taxation structure is required. GAIL has an extensive Pipeline network consisting of 11,000 kms of NG pipeline and is further expanding infrastructure in different states of the country with the aim to achieve Gas based economy in the country.

GAIL is actively engaged with various agencies and authorities such as NITI Aayog, MoPNG, MoEF, MoP, CEA, CPCB, CSE etc. regarding the present challenges faced by Indian gas sector and for taking up suitable enablers required to achieve growth in this sector to move towards gas based economy.





Hawa Badlo - Change The Air Initiative

Air pollution is the fourth biggest risk factor for death in the world. GAIL supports the Hawa Badlo initiative with an aim to motivate people to commit towards air-friendly habits like switching to CNG/electric vehicles, carpooling, and use of public transport. It is not only a corporate campaign but tries to take a step towards inclusive action by creating awareness drive to inculcate minute behavioral changes in the citizens so as to replicate the same on a macro level and hence, bring a significant alteration to the air quality index. The Hawa Badlo campaign has managed to engage as many as 6.8 million people.



Salient features

- | It is a people's initiative to spread awareness about hazardous levels of air pollution and finding measures to fight the same
- | It is an independent national digital movement which aims to assemble knowledge, network, innovation & outreach to come together on a single platform to protect human health and country from the effects of air pollution.
- | It also aims to position Natural Gas as the plausible solution to the menacing problem.



In order to sensitise people about the destructive effects of climate change, GAIL has promoted short film titled, '**Kadvi Hawa Badlo**'. The film is set in the backdrop of a sunken Mumbai city in the foreseeable near future, and stars Sanjay Mishra and Ranvir Shorey.



The short film Kadvi Hawa Badlo takes you on an interactive journey to future with witty Sanjay Misra and sassy Ranvir Shorey with an objective to make each individual accountable and take necessary action, ensuring a greener and cleaner tomorrow.

GAIL, as an extension of the Hawa Badlo campaign, have also joined hands with upcoming Bollywood movie, Kadvi Hawa as Clean Energy Partners. Committing support as clean energy partners of the movie, this association is in line with their commitment to improve

the air quality through collective societal effort under its Swachh Air Mission initiative. While Kadvi Hawa is primarily an entertainer, its purpose is very clear - creating awareness and changing mind-sets to enable individual to take necessary action, ensuring a greener and cleaner tomorrow. The Hawa Badlo movement strives to achieve this very purpose while highlighting the adoption of natural gas as the cleanest fossil fuel. Both aim to achieve the same thing - propagating the thought of reducing every individual's carbon footprint while empowering them to take necessary steps in their daily

Public and private sector companies working in the sector have joined hands to promote the natural gas sector. #Gas4India is a unified cross-country, multimedia, multi-event campaign to communicate the national, social, economic and ecological benefits of using natural gas as the fuel of choice to every citizen who uses, or will use in the near future, gas in any way- cook, travel, light their homes, and power their business. The campaign includes social engagement via Twitter, Facebook, Youtube, LinkedIn, and its official blogsite, as well as hyper local, offline events to directly connect with consumers through discussions, workshops and cultural events. Shri Dharmendra Pradhan, Hon'ble Minister of Petroleum and Natural Gas launched the website, Twitter handle, facebook page and Theme song of the campaign.

Climate Change

We are committed to create a better tomorrow that extends beyond our cleaner energy business. We also recognise that our operations are energy intensive and are taking efforts in this direction. We also monitor climate change risks and opportunities and undertake projects as well as mitigation initiatives to manage these. We advocate more production of gas-based power instead of burning coal and increasing city gas distribution networks to combat rising levels of air pollution. We have adopted Taj Mahal, Agra under "Swachh Iconic Place" (SIP) initiative of Government of India to

promote and enhance cleanliness. We are also supporting various initiatives for improving cleanliness around Taj

Mahal in partnership with local administration



Hon'ble Minister for Petroleum and Natural Gas, Shri Dharmendra Pradhan on inaugurated the first compressed natural gas (CNG) station of Eastern Indian in the city under Pradhan Mantri Urja Ganga Yojana at Bhubaneswar



Our Associations with Key organization

We were part of following associations -

- International Gas Union (IGU) which is a global association aimed at promoting the technical and economic progress of the gas industry and it has close association with GAIL for development of gas sector in India. GAIL represents India as 'Charter Member' at IGU. GAIL along with IGU promotes the "Asia Gas Partnership Summit", a global conference aimed at discussing industry issues and developing gas market in Asia. In the reporting period, we partnered with IGU to host the 5th IEF-IGU (International Energy Forum-International Gas Union) Ministerial Gas Forum in New Delhi with the theme "Gas for Growth; improving economic prosperity and living standards".
- International Group of Liquefied Natural Gas Importers (GIIGNL) offers GAIL a forum for exchange of information and experience among industry counterparts to enhance safety, reliability and efficiency of LNG imports activities and the operation of LNG imports terminals.
- GAIL is 'Category A' member of FIPI (erstwhile PetroFed) and part of the Governing Council. FIPI functions as oil industry interface with the Government, regulatory authorities, public and representative bodies of traders in India to work on issues such as optimization of resources, promoting Safety, Tariff, Investments, Healthy Environment, and Energy conservation among other issues related to industry.
- GAIL is an active member of Standing Conference of Public Enterprises (SCOPE) which is the apex body representing entire spectrum of public sector enterprises (PSEs) in India. SCOPE has representations in various high-level Committees/Boards and helps its member PSUs to reach their voice in various platforms.
- CMD, GAIL is the member of Federation of Indian Chambers of Commerce & Industry (FICCI) Executive Committee and Co-Chair of FICCI Hydrocarbon Committee. Hydrocarbon committee endeavours to deliberate on issues related to energy security of the country and supplement various efforts of the Government of India and other bodies engaged in this area through its intellectual input.
- GAIL is member of Governing Body of World Energy Council (WEC) India, country member of WEC and taking active participation of activities of WEC for development of natural gas in India.
- GAIL is the founding member of the Global Reporting Initiative (GRI) Focal Point India's Sustainability & Transparency Consortium that helps us in engaging with business leaders, national governments, regulators, sustainability experts, think tank bodies and professional institutes to discuss issues related to sustainability reporting. GAIL also represents in GRI Corporate Leadership Group on Reporting 2025, GRI Gold Community and GRI South Asia Advisory Group.
- We are a member of the United Nations Global Compact Network India (UN GCNI) that promotes the UNGC principles on Human Rights, Environment, Anti-corruption and Labor Standards.
- Director (Projects) is a member of Governing Council of UN GCNI.
- GAIL is a member of CPMA (Chemicals & Petrochemicals Manufacturers' Association) which is the apex forum representing the Indian Petrochemical Industry. The Association offers its members a podium to collectively present their ideas, voice concern, and offer suggestions on relevant issues. It provides a linkage between the industry, the Government, and the society.
- GAIL has joined the Pipeline Operators Forum (POF), a non-profit, technical forum comprising of representatives of Global Pipeline Operators for enabling pipeline integrity engineers to share and build best practice, thereby raising the standard of pipeline integrity management. The main objectives of POF are:





- (a) To promote pipeline integrity management globally, Work with industry to improve quality of pipeline integrity management and the services provided
- (b) To upgrade and develop ILI (In-Line-Inspection) specifications, best practices and other relevant documentation
- (c) Share experiences and best-practices of integrity management issues within members (meetings and forum discussions)
- (d) Maintain an environment with access to developed documentation, specifications (through website)

Partnership with The Energy and Resources Institute for climate change vision-

We aim to be one of the pioneer Corporate to take a lead in developing a vision of tackling climate change. We are a member of TERI-CBS (TERI- Council for Business Sustainability) which is an industry led consortium of sustainability practitioners. We





along with TERI have developed a document which outlines the Indian corporate vision on various aspects of tackling climate change and aligning the vision with Government schemes in this direction which was launched at India Pavilion of Conference of Parties (COP) 21 held in Paris. The MoU between FIPI (erstwhile PetroFed) and TERI for undertaking climate change study was signed in the presence of Sh. Dharmendra Pradhan, Minister of State (I/C), Petroleum & Natural Gas and Sh. K.D. Tripathi, Secretary, M/o Petroleum & Natural Gas and representatives from Oil and Gas industry. The "Climate Change Risks: Preparedness for Oil and Gas Sector" study will provide a comprehensive analysis of threats posed by Climate change to Oil & Gas sector, participating companies and shall provide a way forward to tackle the challenges, risks posed by climate change.

The study will suggest suitable measures for the Oil & Gas sector to achieve India's INDC target of reducing emission intensity of GDP by 33 – 35 per cent below the levels in 2005 by 2030. The study would further highlight how the global market and technological options are likely to change because of global climate policy measures; and how the 1.5 degree and 2 degree scenarios of global warming are likely to affect the infrastructure and operations in different climatic zones of India.

We have contributed to tackle climate change at COP 21 by being part of delegation of MoPNG. We are one of the three public sector undertakings which presented a paper at a special event held at the India Pavilion in line with the agenda of COP21. It articulated the initiatives taken by us such as energy conservation, reducing carbon foot prints, tree plantation and construction of green buildings. It stressed upon the need to increase use of the eco-friendly fuel for power generation and vehicular movement.

Anti-Competitive Behaviour

We are a signatory to the United Nations Global Compact (UNGC) working in the domain of Human Rights, Labour standards, Environment, and Anti-Corruption. We also fall under the purview of the Competition Commission of India. Thus, we are committed to ethical behaviour and do not indulge in any form of practices which can potentially restrain any competition in the market. We work strictly according to the laws and regulations including those involving anti-competitive and ethical behaviour. There have been 15 cases which have been filed against GAIL regarding unfair trade practices, restrictive trade practices and misuse of monopoly. There are no more cases other than that are reported in the year 2016-17 from cases as reported above.

Our Legal Compliance Management System (LCMS) ensure compliance to all national and relevant international regulations and regulatory compliance requirements across various segments. One of the integral parts of online LCMS is Periodic review and audit.

We have set up a detailed environmental management system to manage our emissions, effluents, and waste in an eco-friendly and efficient manner. We dispose of waste in compliance with applicable regulations. All statutory compliances are taken at the right time, along with creation of separate budgets for compliances. The Directorate General of Hydrocarbons (DGH) has been entrusted with the obligation of advancing exploration and sound management of petroleum and natural gas resources as well as nonconventional hydrocarbon energy while balancing regard for the triple bottom-line.

GAIL has taken up with Ministry of Finance and state government for inclusion of Natural Gas under GST. The matter was taken up by GAIL directly as well as through Federation of Indian Petroleum Industry (FIPI). Senior executives of GAIL also met with the ministers and senior officials of Bihar, AP, Gujarat, and UP governments for requesting the respective government to consider inclusion of Natural Gas under GST.



CHAPTER

9

Stakeholder Relationship Management



GAIL Management addressing Press Conference



Stakeholder Relationship Management

As a responsible corporate, we ensure positive value creation for our stakeholders and try to build trust, aided by understanding their viewpoints and motivations. We believe that there is business sense in ensuring sustainability of not just our operations but also that of our stakeholders. Engaging with stakeholders helps us to ensure addressal of potential issues. Alternately, the issues are revisited and changed based on discussion and mutual understanding.



Our Approach



ommunication and stakeholder relationship management have always been a priority area for us. In this dynamic environment, effective and focused communication with the internal and external stakeholders is imperative. We maintain a close relationship with our stakeholders by taking proactive measures to

communicate at regular intervals. Further, we maintain optimal visibility as well as brand recall in the mind-space of investors and the public base at large. To accomplish our shared common vision of transitioning towards a low carbon economy, Natural gas as a cleaner alternative can act as a bridging fuel in this transition. This adaptation requires long term and stable relation with all the stakeholders.

Relationship with stakeholders for us is an intangible asset contributing highly to the value of our company. We effectively manage relationships with each of our stakeholder groups to enhance the quality of our intangible assets and thus increase the overall valuation of our business. For each stakeholder group the principles of integrity, authenticity, and engagement apply. Further, their concerns were identified through various other channels and engagement mechanisms which have been provided in detail in the section Stakeholder Engagement and Materiality of this report.



GAIL's CSR Stall at DPE CSR Fair 2017 inaugurated by Honorable Minister (HI & PE), Shri Anant G Geete





Shareholders/Investors

The objectives of our Investor relations activities are to develop a long-term relationship of trust with stakeholders. This is achieved by fulfilling our responsibilities not only to shareholders but also to all other stakeholders, through fair disclosure of information to obtain their confidence and esteem through bilateral communication. In order to pursue these objectives at all times, we consistently disclose necessary information to investors and Stock exchanges and conduct various investor relations activities.

Holding an Analyst Meet was formalized by Guidelines on Investor Relations for CPSU dated in 2011, by Department of Disinvestment, Ministry of Finance which recommended organizing an Analyst Meet at least once in a year. To pursue the objective of effective communication with investors, we also attended 7 domestic and 1 international investor conference organized by top brokerage houses of the country. All these meetings/conferences were attended by Top Management/Senior Executives from Finance, Marketing, Business Development and Projects in addition to executives from site offices. We also organized two-day Plant visit (Auraiya Compressor Station and Pata Plant) for

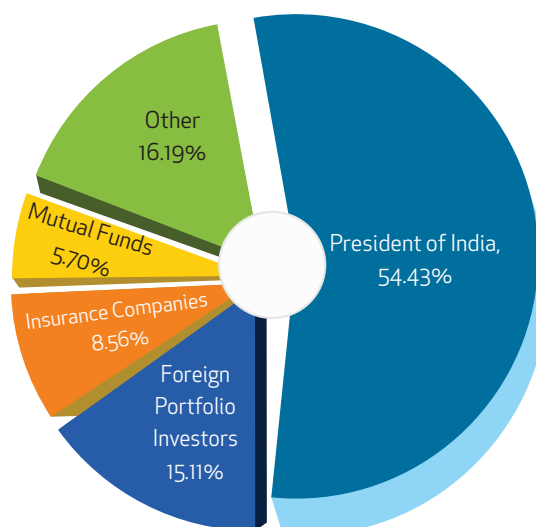
Investors in March 2017.

Investors acknowledged the management interaction where most of the queries pertaining to the petrochemicals plant were satisfactorily answered. During FY 2016-17, 19 complaints were received from the shareholders/investors through SEBI/ Stock Exchanges and other statutory bodies and all complaints were resolved.

As per requirement of SEBI (Prohibition of Insider Trading) Regulations, 2015, Company's Board has approved Code of Conduct to Regulate, Monitor and Report Trading by Insiders (Insider Trading Code) and Code of Fair Disclosure and Conduct- Practices and Procedures for Fair Disclosure of

Unpublished Price Sensitive Information (Principles of fair Disclosure), available on our website.

It is our continuous endeavour to provide world class investor relations services in disseminating information to Investors & Analysts at right time and from the right people. In view of the above, Investor Zone section of corporate website has been reviewed and made more informative and investor friendly. The Company believes that it must provide to capital market participants (including shareholders, investors, and securities analysts) accurate information that meets their requirements. The investor presentations are available on this section of our Corporate website.



Shareholding Pattern of GAIL as on FY 16-17

Customers

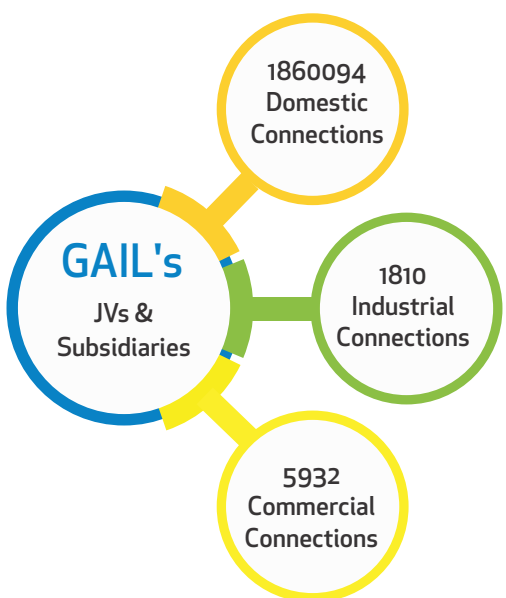
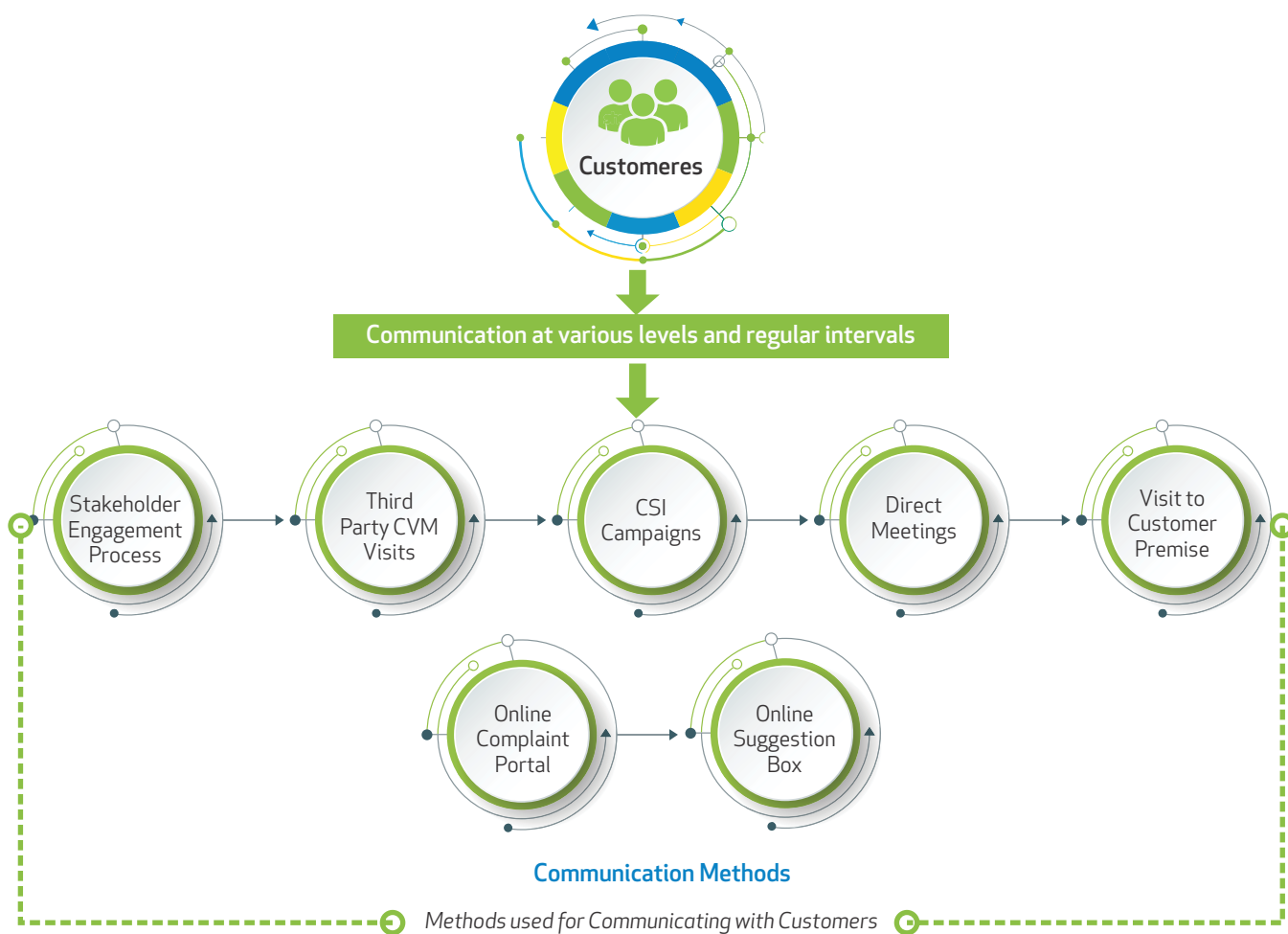
Responsible growth is our key objective which can be achieved by exhibiting empathy towards customer needs and demands. We aim to provide value to our customers by giving them superior quality of product with uninterrupted supply. The figure below depicts the

various methods of interaction with the customers. The objective of communication is to understand various customer concerns and build long term valuable relationship with our customers. A large customer base is created by delivering enhanced value.

We have expanded from our original core business of transporting natural

gas and LPG to City Gas Distribution in recent years. The expansion has been through 08 Joint Ventures and 02 subsidiaries. Urja Ganga project launched recently is expected to be the lifeline of central and eastern part of India in near future.





Customer meets

We have taken various initiatives to engage with our customers through customer visits and personal interactions. Some other touch points used by us were Customer Satisfaction Index (CSI) campaigns, stakeholder engagement surveys, online suggestion box, online customer complaint portal and third-party Customer Value Management (CVM) visits. Business segment wise summary of interaction with customers is captured under CAMS. The strategic intent is to get first-hand information of market intelligence, build and strengthen customer relationships to augment sales, address customer's concerns and expectations and share with top management / other departments, resolve customer's grievances, build personal rapport with customers and technical trouble shooting.





During FY 2016-17, a total 118 visits were undertaken for CVM purpose in Natural Gas, Petrochemicals and LHC business segments. In this, 75 customer visits were undertaken by a consultant engaged by TQM department and 43 customer visits by our executives. Customer meets are conducted at regular intervals for resolving issues of customers by Zonal offices.

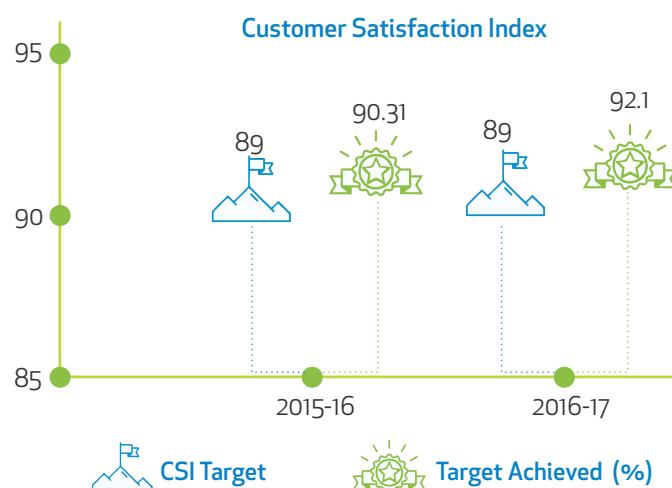
Customer Satisfaction Index (CSI)

To improve our products and services continuous customer feedback is essential. To better understand the perspective and satisfaction level of our customers, an annual survey is conducted to check the level of customer satisfaction on several parameters such as our product quality, usability of product, technical support, delivery of material, packaging, service quality, concerns, and suggestions for improvement. On a half yearly basis, this customer feedback is collected through an online survey

Vendors and Suppliers

Vendors and suppliers have been a key component of our supply chain in ensuring constant availability of product and services. Our supply chain includes a strategic mix of global and local suppliers. All the tenders are floated in public domain and all the complains from supplier's side are addressed in a fair and transparent manner. Regular engagement with suppliers is undertaken through

supplier meet at different locations. The agenda of the meeting generally revolves around supplier training and our tendering process, supplier awareness, reducing the processing time and increasing supplier's participation in our procurement practices. In the FY 2016-17 a Vendor Meet for Medium and Small Enterprises (MSEs) was organized at the GAIL Training Institute to enhance compliance of MSEs to the Public Procurement Policy.



Vendor Development

To ensure wider participation and educate vendors on the tendering process we conduct a pre-tender meeting. We also support smaller vendors by speeding up the tendering process and reducing the paper work through the introduction of e-procurement. Interactions with small and local vendors is done at vendors meet, MSE meetings and industry conclaves to share our requirements and to encourage them to bid for these. Presently we source 25.85% of our supplies from MSEs.



Indigenization Development Groups have been established to decrease our reliance on imports and develop resilient supply chain. With the help of these groups we have substituted various chemicals with indigenous sources

We aim for continues improvement and capacity building of our vendors through Vendor Development Programmes. During the vendor meets detailed discussions regarding a wide range of issues, methodologies, and procedures pertaining to the awarding and execution of contracts are undertaken.



Supplier Screening

We endeavour to ensure that our philosophy is inculcated across all suppliers in the value chain. We deal with number of contractors, vendors, and suppliers for procurement of various external services and contracts including upstream, mid-stream and downstream. Human rights are one of our core values and no grievances related to human rights and child labour were noted in FY 2016-17. As per the GCC (General Conditions of Contract) our vendors must confirm that they do not undertake child labour.

Supply Chain Practices^o

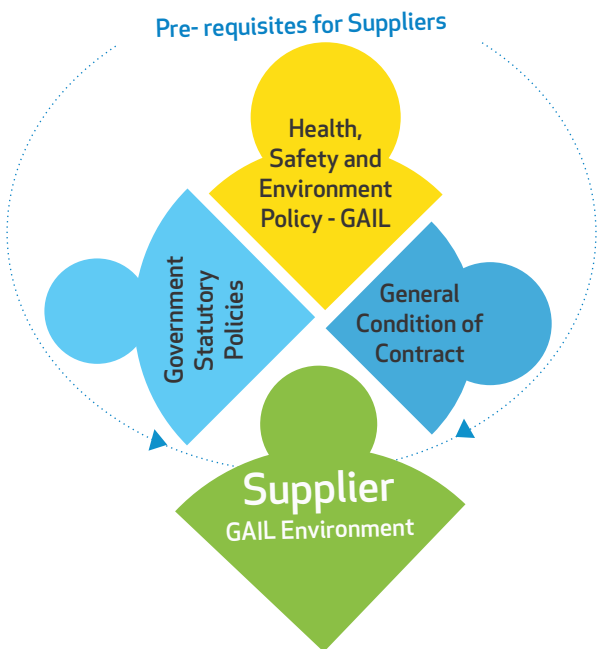
To support the growing energy needs of Indian economy a well-diversified portfolio of energy mix is desirable. We were incorporated to ensure energy security of the nation through natural gas and its various forms in a sustainable manner and at competitive prices.

Gas can play an important role as a

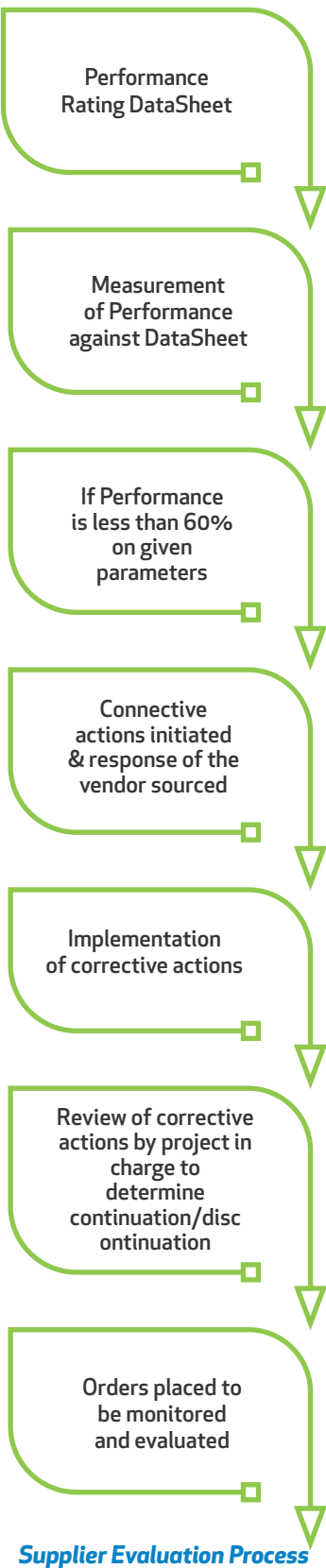
Bridging Fuel during the transition to a lower emission intensity GDP regime. We are the largest supplier of natural gas in India and contribute to approximately 60% to the natural gas in India. We have extended our operations in these segments through equity and joint ventures participation. Further, diversification in solar and wind projects have been added to our supply chain.

Supplier Impact Assessment

We evaluate our suppliers to ensure quality and timely completion of works and services. The evaluation procedure is laid down in a contract with the objective to monitor the performance of our vendors/ suppliers/ contractors and consultants. Further, the evaluation of performance also gives us an opportunity to develop a network of reliable vendors who efficiently meet our expectations and requirements. A holistic overview of the process for supplier evaluation is described by the graph below.



The tender document contains all the details of the variations that exist between projects, operations & maintenance, and consultancy tenders. Further, based on performance rating for operations & maintenance projects the tender documents also state the action to be initiated.





Green Procurement

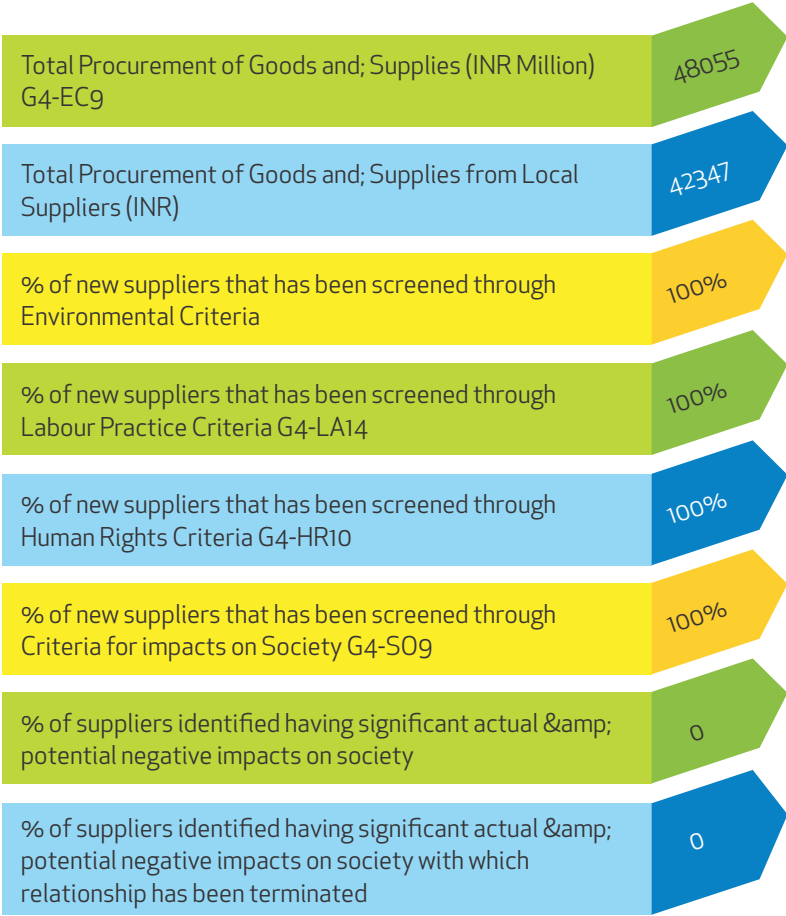
We have introduced e-tendering which is based on the principle of competitiveness. The procurement practices are executed in a manner that is transparent, fair, competitive and cost effective. This process also contributes towards saving of paper and is a green initiative of the organisation. Our IT team continuously works with various departments to provide solutions to the internal and external customers, and extend IT enabled services across the entire process. We have introduced the following provisions to procure energy efficient and sustainable products

- Loading criteria in tenders for procurements of compressors, turbines, generators etc.
- Star rating electrical equipment
- Green building concept in all new building projects

To ensure sustainability in the supply chain, GAIL has implemented Public Procurement Policy for MSEs, Domestically Manufactured Electronic Products (DMEP) policy and initiated Make in India campaign in GAIL to develop local vendors and ensure a sustainable future.

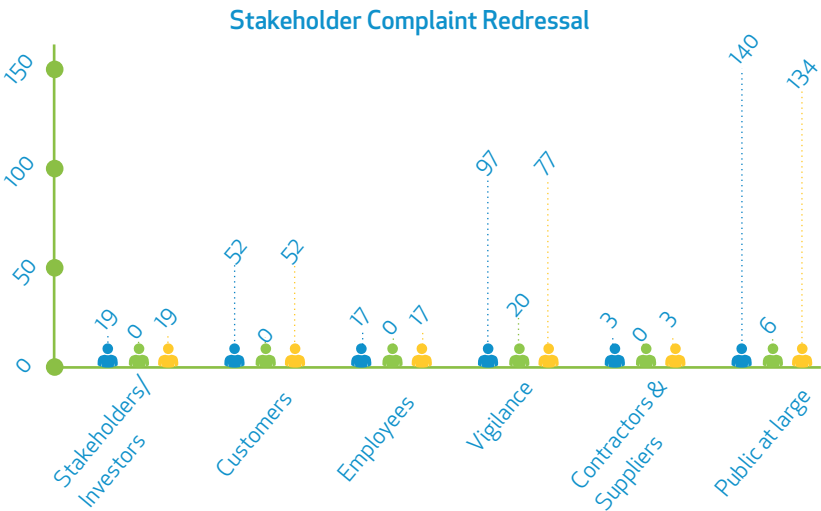
Spend Analysis

We have introduced e-tendering which is based on the principle of



Stakeholders Complaint redressal

We have set systems and process to maintain an efficient and effective communications with all the stakeholders. The details of various modes of communication have been shared in the previous sections. The various complaints received and resolved during the year for different stakeholders is indicated in graph





Product Stewardship

Majority of GAIL's product line is natural gas or its derivatives like LPG. These products are environmentally benign and are sought by other industries to meet their environmental stipulations. The only product for open market is our polymer produced from our petrochemical operations. We aim to develop safe and environmental friendly products. We continuously explore our supply chain by considering the lifecycle impacts of our products in terms of safety and environmental impact and seek viable options to mitigate them.

The high recyclability attribute of plastics makes us behold them as eco-friendly. We have collaborated with Indian Centre for Plastic in the Environment (ICPE) to build awareness of consumers on advantages of plastic products necessity to create a secure plastic waste management system.

All our major installations are accredited with OHSAS 18001 which is testimony to our commitment towards health and safety impacts. Our Gas Management system, provides a seamless interface access to our value chain. GSM can handle multiple sources of supply and delivery of gas. The entire order-to-cash cycle has been automated and streamlined and is available on real time basis from upstream gas supply, gas transportation to billing, payment, and final receipt of payments. Customers are well informed through the GMS portal facility enabling them to plan and better utilize the gas supply.

In FY 2016-17 there have been no incidents of non-compliance with respect to regulations and voluntary

codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes.

Reducing the environmental impact and finding a cleaner alternative is indispensable part of the journey. Natural Gas which is a cleaner alternative to other fossil fuels, minimize impacts on environment. We have developed suitable systems to ensure that the benefits of this essential fuel reach the society without compromising on safe use.

We align ourselves with the government mission to provide energy security to most marginalized section of society and have worked towards established a firm footing in CGD over last 10 years.

Display of product information and Labelling

We comply with all domestic and international standards with respect to labelling. The label bears the product details, company logo and weight information. Before the commencement of supply product specification is provided. Additionally, for PC and LHC dispatch, apart from complying with the statutory requirements we also provide test reports to conform the parameters of quality of the product being supplied.

All marketing communications codes and standards including ISO 9001:2008, solvent control order, PNGRB codes, applicable BIS standards, OISD guidelines, PESO standards and regulations, Weights and Measurements Code are applied across the organization.

Regardless of the nature, Customer can lodge complaints online through GAIL's webpage. Our customers can register Service Request / Complaint / Incidents 24 x 7 online. In FY 2016-17 there have been no incidents of non-compliance with regulations and voluntary codes concerning product and service information and labelling.

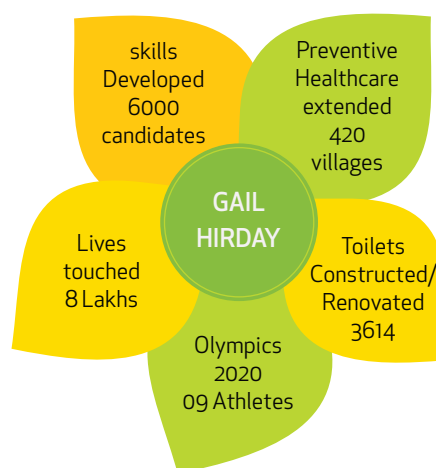


Fig: Reach of GAIL HRIDAY

NGO and Communities

We support and promote economic, social, and environmental progress leading to a better quality of life for people at large. Working for the society and the surroundings creates a rapport and goodwill in the regions we operate. This synergy of smooth operations and overall development has earned us a name to reckon with. For effective development of community, we have developed CSR policy and we have a structured framework to address the needs and concerns of the communities through our corporate social responsibility programs. We consider community as a key stakeholder and appropriately address their concerns.





Impact Assessment

GAIL has conducted three Independent Impact Assessment Studies for its CSR Projects in the last decade from Institutes and Consultancies of repute which include Tata Institute of Social Sciences (Mumbai, Maharashtra), Soul Ace Consultants (Gurgaon, Haryana), Delhi School of Social Work and Jamia Millia Islamia (Delhi). The CSR projects are evaluated on milestones achieved by the Cross Functional CSR Committee formulated at every work centre of GAIL. At the end of the project, a report pertaining to the impact of the programme is submitted by the implementing partner specifically highlighting the project milestones achieved and the quantitative and qualitative benefits generated.

Overview of GAIL's CSR initiatives

We have a CSR committee constituted by Board of Directors with CMD as Chairman of the Committee and Director (HR), Joint Secretary (MoPNG), and two Independent Directors as members. The information about CSR Committee can be accessed on the company website and in the annual report. Our annual report on CSR policy and programmes implemented is included in the Board of Directors' report. We undertake CSR projects in sectors as identified under Schedule VII of the Companies Act, 2013 with special focus on seven broad areas of CSR intervention, each of which is titled by the objective they seek to achieve.

To achieve the defined target, we made commitments to the tune of INR 117.42 Crore on CSR activities of 2016-17.



(From left to right) Vandana Chanana, GAIL Executive Director (Corporate Communication & CSR) and PK Gupta, Director (Human Resources) receiving the 'Economic Times 2 Good CSR Rating' certification from Jaco Ciliers, Country Director, United Nations Development Program and Nishi Vasudeva, Ex-CMD, Hindustan Petroleum Corporation Limited

Against the said commitment, we have incurred a total expenditure of INR 123.58 Crore, out of which INR 92.16 Crore have been spent exclusively on CSR projects/ programmes approved in FY 2016-17 which amounts to 2.26% of the avg. net profit of the preceding three financial years.

Special initiatives undertaken

As per the principle which advocates inclusive and equitable development it can be noted that our CSR presence is Pan-India. Projects like GAIL- Air Force Wives Welfare Association (AFWWA) for the support to Umeed Asha Kiran Schools for special children with an

idea to empower and educate specially-abled children. We have facilitated this via contributing for various articles like furniture, teaching aids etc.

GAIL-Artificial Limbs Manufacturing Corporation of India (ALIMCO) Project – has been incorporated for supplying Aids and Assistive devices for PwDs through camps around our work centres with a cumulative value of INR 100. Lakh.

Several programmes are undertaken to empower and uplift the marginalized to mainstream them e.g. Utkarsh provides free residential coaching for IIT-JEE & other Engineering Entrance exams for economically weak students.



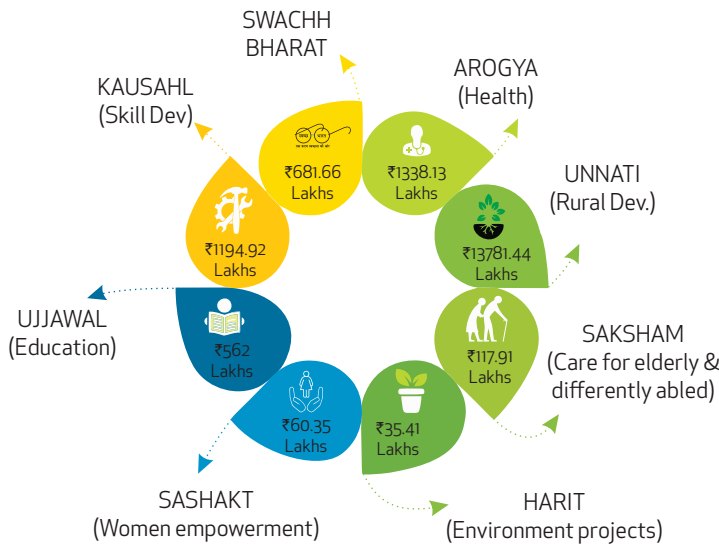
GAIL Indian Speed Star

Anu Kumar wins Silver Medal representing India in the 800m final of the World School Athletics championship being held in France. Anu Kumar is one of Season 2 selection of GAIL-Indian Speedstar. He hails from Uttarakhand. It is a very proud moment for GAIL, NYCS and team. Expenditure to train and promote Rural Sports, Nationally recognized sports, Paralympic Sports, and Olympics Sport is Rs. 1030.53 Lakhs.





We have also launched GAIL Indian Speed Star, to mine out the talent in sports, which aims at identifying potential athletes from various corners and rural belts of the country and train the qualifying athletes to qualify and participate in National and International Athletic events. In the 1st phase, young athletes have been identified from 51 districts across 10 states of India. Finally, 9 students have been shortlisted, who, will be trained nationally and internationally.



GAIL's Project Shrijan

Project Shrijan (Creation) is a GAIL initiative launched to provide relief to the communities of Uttarakhand devastated by the floods and landslides. The natural calamity of June 2013 and affected more than nine million people, with a death toll of more than 4000. We sought to extend long term support to the people in and around the affected areas. This was achieved through a cross-sector and forward-thinking approach to disaster management and mitigation. The resilience raising exercises



implemented by us includes: the provision of new skills and career paths to reduce dependence on conventional sources of employment psychological counselling, training, SHGs and FIGs formation etc. There are 7,614 individuals supported through it. We encourage a stronger and more diverse economy in the region. It is doing this by supporting more women to become involved in the project, including enterprise supporting initiatives such as micro financing and inter-lending.

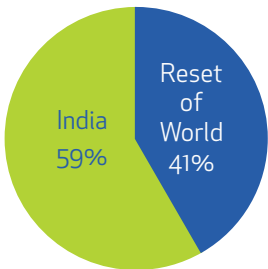




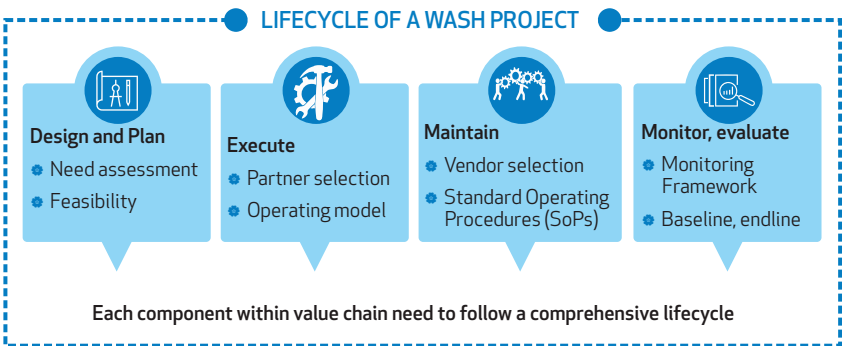
GAIL's Prjct Shrijan, has received the prestigious FICCI CSR Award, 2016 and has been shortlisted under UPS international Disaster Relief and Resilience Award category in Responsible Business Award 2017 to be held in London for recognizing GAIL's unique contribution in addressing international disaster, helping communities to prepare for, respond to and recover from disasters.



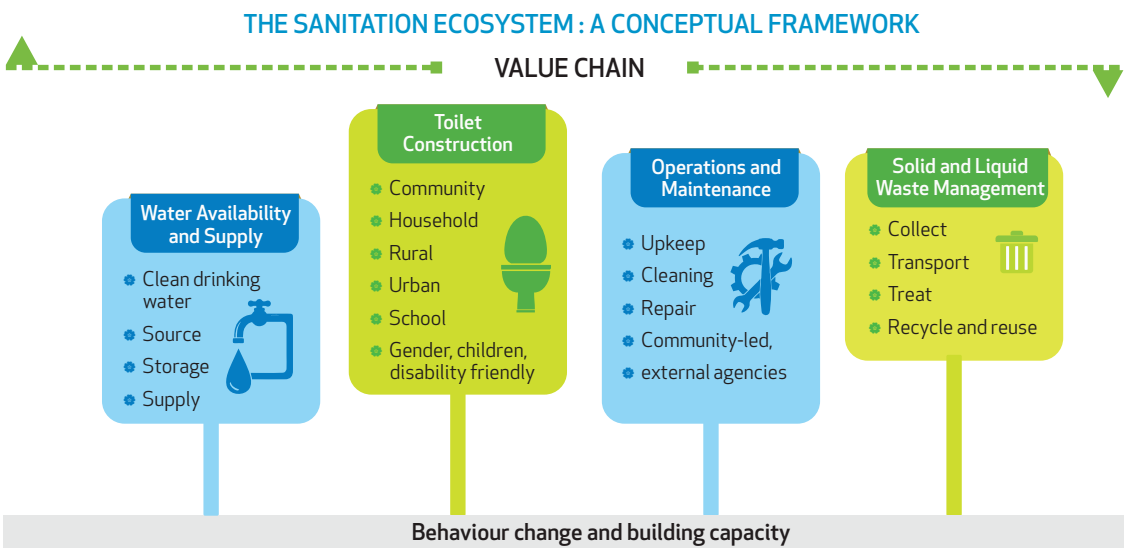
World wide scenario of Open Defecation



1.1 billion people in the world defecate in the open



CSR in WaSH





WaSH stands for three interrelated public health areas that require urgent attention – water, sanitation, and hygiene. The current sanitation crisis in the country is due to the neglect of these areas. Poor sanitation, water and hygiene can have serious repercussions on healthcare, education and economy. In the current scenario of 50% of the nation’s population defecating in the open, sanitation has become national priority. The Swachh Bharat Mission has

catalyzed the conversation around sanitation.

88% of diarrhoeal deaths globally are due to a lack of access to proper sanitation facilities

67% of rural Indian households still do not have access to proper sanitation facilities

97 million people in India are vulnerable to many communicable diseases due to ingesting unsafe water

Swachh Bharat Mission

We are among top 5 public sector enterprises with the largest budgets in Water, Sanitation and Hygiene (WaSH), according to a very recent report by Samhita and Indian Sanitation Coalition

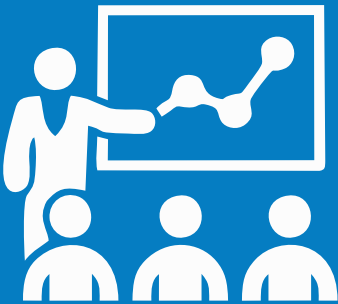
Details of stakeholder engagement with the employees is covered in the chapter Human Capital and Practices



CHAPTER

10

Human Capital & Practices



Total Training man-hours
imparted to
employees was **48283**
in FY 2016-17



81% employees of GAIL
have been **Trained**
in sustainable Development



Glimpses of Cyclothon at GAIL Pata during Saksham 2017



Human Capital & Practices

At GAIL we establish positive, ethical, and strong organisational culture ensuring an engaged, healthy, and inclusive workforce. We mentor our people, in line with the direction of business, and deliberate to them the course of action required to achieve the goal.

There are established systems to attract, retain, develop, and motivate our existing manpower and for our recruitments which are growing in numbers looking at our business expansion. All human resources processes are carried out with prudent planning and efficient execution for talent attraction, retention, development, and motivation.



As we gear up for dynamic environment of the oil and gas sector, employees lie at the core of this growth. We recruit, train and develop our human capital in alignment with our future strategies, goals and aspirations considering the regulatory environment, national and global priorities. GAIL lays a lot of importance on transparency, accountability, collaboration and human capital development in order to address both, challenges of the present day as well as the future. A compassionate approach towards the community lies at the heart of our operations at GAIL. Our CSR goal is to identify answers to social challenges and to actively contribute to the development of sustainable solutions. This year expenditure on CSR activities was INR 123.58 Crores.

Director (HR)



Our Approach



Our major emphasis is on aligning human resource development initiatives with strategic objectives to achieve organizational goals. The focus is on skill development, capability building, talent acquisition, development, and retention. Our aim is to align HR processes and systems with our business requirements. To accord with the current scenario we continually assess our manpower requirements across various functions requiring specialised skill-sets. The cross-functional teams have also been developed to acquire multiple competencies. We embark on trainings as a pivotal tool for capacity building and promote effective performance of all the Employees.





Leadership Development and Succession Planning

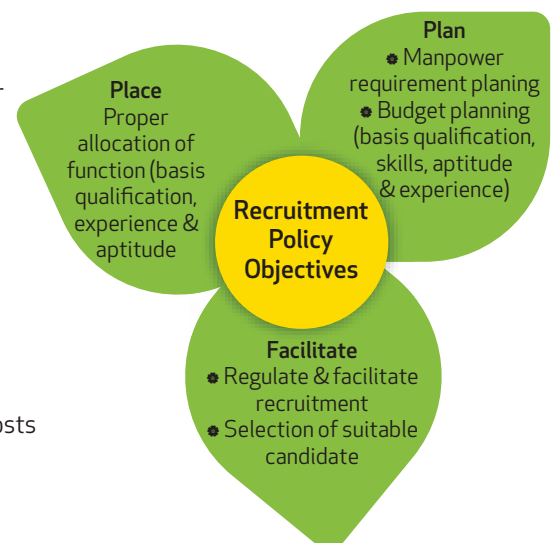
One of our top priorities is to ensure the development and honing of leadership capabilities of the employees. To build the capabilities of the Senior Level employees, we conduct Leadership Development Programme, based on the Senior Management Development Centre (SMDC) exercise. All Executives in the Senior Manager (E-5 Grade) and above have undergone this exercise. A comprehensive Individual Development Plan (IDP) was drawn to

support the identified area of improvement of the participants. With a view to ensure consistent Leadership Pipeline at the Senior levels, we are also actively pursuing to put in place a Succession Planning Framework.^{G4-LA11}

Attracting the right talent

The volatility in the oil and gas sector globally has led to major challenge in attracting talent. To meet this challenge, our robust recruitment policy emphasizing on merit based selection has been very helpful. G4-DMA

Our Recruitment process comprises of two major aspects, one in which we engage fresh talent and develop them and second in which we engage people with requisite experience and skill set to fill the immediate gaps. Our Human Resources Assessment Exercise (HRAE) is done at the Corporate level.



The following table provides information on our new hires during last four financial years: G4-LA1

	Male	Female	Total
New hires in 2016-17	107	12	119
New hires in 2015-16	134	2	136
New hires in 2014-15	300	14	314
New hires in 2013-14	121	11	132



Retaining and motivating talent

Motivation plays a fundamental role in enhancing the employee productivity and performance, thus leading to overall greater business performance. We strongly believe in investing in our employees’ engagement to keep them motivated and promote culture of synergized efforts. The employees are engaged through several formal and informal initiatives to enhance employee morale and improve employee retention.G4-10

We conducted Employee Engagement Survey named as “GAIL PULSE” in FY 2015-16. Survey covered all regular employees on the rolls. Overall response/ participation rate for GAIL PULSE was at 63%. Post survey, findings were validated with the help of Focus Group Discussions conducted in Delhi/ NCR; Pata; Vijaipur and other major work centers. Final analysis and recommendations of the GAIL PULSE Survey were discussed in the Action Planning Workshop held at Corporate Office. Actions as envisaged in the Action Planning Workshop for the identified area of improvements are being planned for phase-wise roll out.

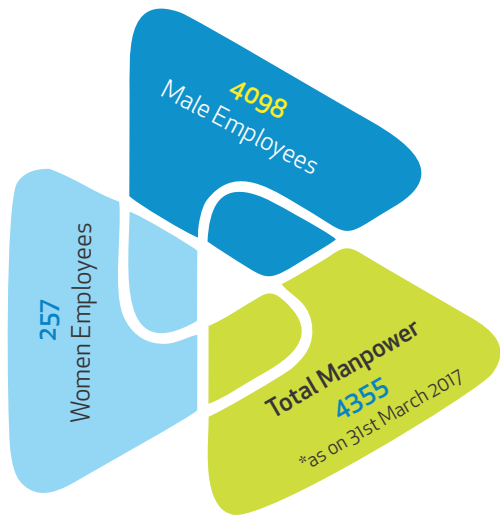
We endeavor to provide a good work life balance to our employees to achieve higher retention and lower employee turnover. GAIL offers attractive compensation package to its employees. We provide several other benefits such as house building advance, conveyance advance, furnishing advance, and computer/laptop advance. Higher qualification incentive is offered to motivate employees to attain higher qualification relevant to their function. GAIL is also among the first PSUs to provide a two year child care paid leave to female employees. Under our defined benefit plans we make contribution towards Superannuation Benefit Fund Trust and Provident Fund Trust. Apart from these GAIL provides other benefit plans to employees that include Gratuity, Post-Retirement Medical Benefits, Earned Leave Benefits, Terminal Benefits, Half Pay Leave and Long Service Award.

Employee Motivation has a significant HR aspect as below:

<ul style="list-style-type: none">Regular Review of HR/ HRD Policy FrameworkConsistent & value-adding Learning & Development opportunitiesSystematic Placement to ensure right person for the right job	<ul style="list-style-type: none">Induction cum Orientation of New Joinee& MentoringRegular monitoring of Grievance Redressal MechanismContinuous improvement in infrastructure and other facilities at work-centers	<ul style="list-style-type: none">Monitoring of average response time for employee’s claims/ requests etc. through SAPStructured Leadership Development Program
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In addition to formal and structured training, we offer on the job training to our workforce that motivates them to perform better and in turn contribute to their success and our growth. This is a major factor in retaining our talented professionals for a long duration. GAIL HR team has formulated a rigorous and effective Induction cum Orientation Training Program for fresh recruits i.e. Executive Trainees.

As a part of this orientation programme, the new recruits interact with the heads of various business functions giving them greater insight of our businesses and value chain. To enable seamless integration of new recruits into our culture, we have introduced Mentorship program in the organization for the Executive Trainees, wherein they are assigned to a mentor who is a senior executive in order to assist them in any personal or professional matter.





Capacity Building

We firmly believe that human resource is one of the most vital assets for achieving our Vision, Mission, and objectives. Thus, capability building and talent development have been the key focus areas. We offer opportunities to our employees to sharpen their skills by learning basics of other functional areas in the cross-functional training programs and practical exposure to highly specialized jobs. Our two training facilities namely GAIL Training Institute (GTI), Noida set up in the year 1997 and GTI, Jaipur set-up in 2005 rolls out a comprehensive electronic Training Need Assessment (TNA) System for all Executives every year where the Training Needs of all Executives are assessed with the inputs from Employees as well as from their reporting & recommending Executives. G4-DMA, G4-LA9, G4-LA10

Based on training needs identified through TNA, all the employees are allotted with one functional/ cross-functional and behavioural training for the FY 2016-17 and Annual Training Calendar (ATC) FY 16-17 was prepared and executed by GTI as per schedule. It has been conferred with the prestigious Golden Peacock National Training Award – 2016 for its initiatives.

In FY 2016-17, an average of 45 hours of training was achieved per employee and the total training expenditure for the FY 2016-17 was Rs 12 Crore.

GTI Organized Training programs in the capability building areas identified in Strategy 2020 such as Hazard Identification Techniques and Risk Analysis, Business Modelling, and Financial Analysis through Excel, Hedging and Risk Management, LNG Industry Development in International Scenario Including Shipping and Global Energy Market and Competition. Senior Management Development Centre (SMDC) exercise was carried out by HRD Department in FY

2016-17 for 316 executives in E-5 grade with an objective to access the potential of executives at the level of Senior Managers with the revised competency framework i.e., based on competencies 7 competencies namely Managing Relationship, Analytical Problem Solving, Building Capability, Achievement Orientation, Execution Excellence, Planning, organizing & Foresightedness, and Communication. Customized Individual Development Programs (IDP) was conducted through IIM Lucknow & IIM, Kolkata.

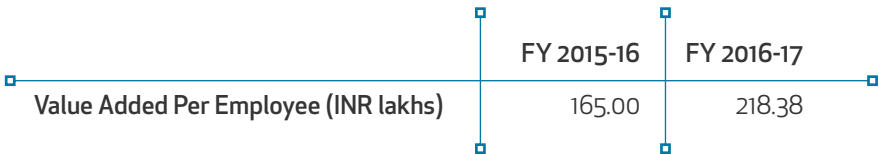
Management development programme for newly promoted DGMs/GMs/EDs was conducted at GTI during the year. As a knowledge management initiative, 9th Knowledge Sharing Seminar was organized at GTI Noida during September-2016. Out of total 75 papers in 4 different categories (Energy conservation, HSE&CSR O&M (P/L & Compressor station, O&M (Process plant) and Corporate function), 22 shortlisted papers were presented and evaluated by Jury. Best paper was awarded in each category suitably.

GTI had also conducted various quizzes through Intranet for all the employees in different subjects (GAIL Business, Ecology, Environment & Clean India, Hindi, Constitution of India & Energy Conservation). We also impart trainings on sustainability, soft skills, motivation, functional aspects, health, safety, environment, human rights. 81% employees of GAIL have been trained in Sustainable Development.

A Training program cum familiarisation test was conducted by GTI for eligible S7 employees for promotion. As part of the SMDC exercise training programme were organized at IIM for the eligible employees and a case study session on the topic was organized at GTI.

As a knowledge capturing and knowledge dissemination initiative, Case Study Workshop was conducted for 40 employees from various work centres. 9 Nos. of case studies were developed in the

Percentage of Employees who received Skill up-gradation Training FY 2016-17	
Total Permanent Employees	90.5%
Permanent Employees Male	94%
Permanent Employees Female	87%
Disabled Employees	88%





areas of NG Pipelines, LPG Pipelines, Petrochemicals, Gas Processing plant, GPU & P/L Maintenance. Further, to make awareness on health & stress management among the employees, a set of books were distributed to all the employees. In addition, our Suggestion, Learnings, Innovation, Case Studies & Extraordinary (SLICE) scheme received 190 entries and out of it 11 of them have been implemented after review by SLICE Committee. Other key initiatives taken up:

We have formulated numerous programs for the superannuating employees to ensure a smooth life ahead for them. These programs consist of elements which focus on ways to cope with old age challenges and to manage their time in a fruitful pursuit. We also provide them with awareness on financial investment schemes and other legal obligations such as writing of will and have a special portal to informed about important activities and facilities we provide them.

Employment and Labour Practices

Their occupational health, safety and security is of paramount importance to us, thus to ensure this we have taken preventive and protective measures. GAIL has 100% representation of its workforce at formal joint management health and safety committees that help us monitor and prompt them on occupational health and safety programs. The details are mentioned in the Health and Safety chapter

We want our workforce to feel cherished and supported. We are also aware of the benefit of maintaining a

diverse and inclusive workforce, for the business. We promote an environment that is based on virtue and inclusion, where all employees can develop their full potential and get an equal remuneration irrespective of their age, belief, disability, ethnic or national origin, gender, gender identity, marital or civil partnership status, political opinion, race, religion, or sexual orientation. As mentioned earlier, we have a completely merit based approach towards recruiting our employees. G4-EC3, G4-LA2, G4-LA13, G4-DMA

There is complete compliance with the Equal Remuneration Act, 1976 and there is no discrimination in wages based on gender. Despite inherent challenges within our sector towards recruitment and retention of women employees, we have been focused in our efforts to create a conducive environment for them. A special Women's Cell at GAIL is focused on reaching out to the women workforce, initiate discussions and adequately address their concerns including sexual harassment at workplace. We have a Policy on Prevention, Prohibition, and Redressal of Sexual Harassment of Women at Workplace in line with the requirements of the Sexual Harassment of Women at the Workplace (Prevention, Prohibition & Redressal) Act, 2013. Internal Complaints Committee (ICC) has been set up to redress complaints received regarding sexual harassment. During the year 2016-17, three sexual harassment complaints received and same were disposed of in FY 16-17.

Additionally, we have set up Ladies' Clubs at our operational sites and have instituted GAIL women's awards to



promote their involvement and enhance satisfaction.

Freedom of Association & Collective Bargaining

GAIL upholds the Freedom of Association and Collective Bargaining by recognising and supporting the Workers' Unions, Officers' Associations, Women's Forums, SC/ST Employees etc. In GAIL, there are two Unions representing the interests of their respective workmen/ staff. GAIL Employees Association (GEA) is a representative body of non-executives posted at various Field Offices/ Plants/ Installations across the Country except Corporate Office. Non-executives posted at Corporate Office are represented through GAIL Karamchari Sangh (GKS). Percentage of regular employees as members of these recognized employee union is 20.41% G4-11, G4-DMA, G4-HR4

Discussions with employee collectives both at Work Center and Corporate levels are held on Monthly / Bi-Monthly/Quarterly basis. For effective



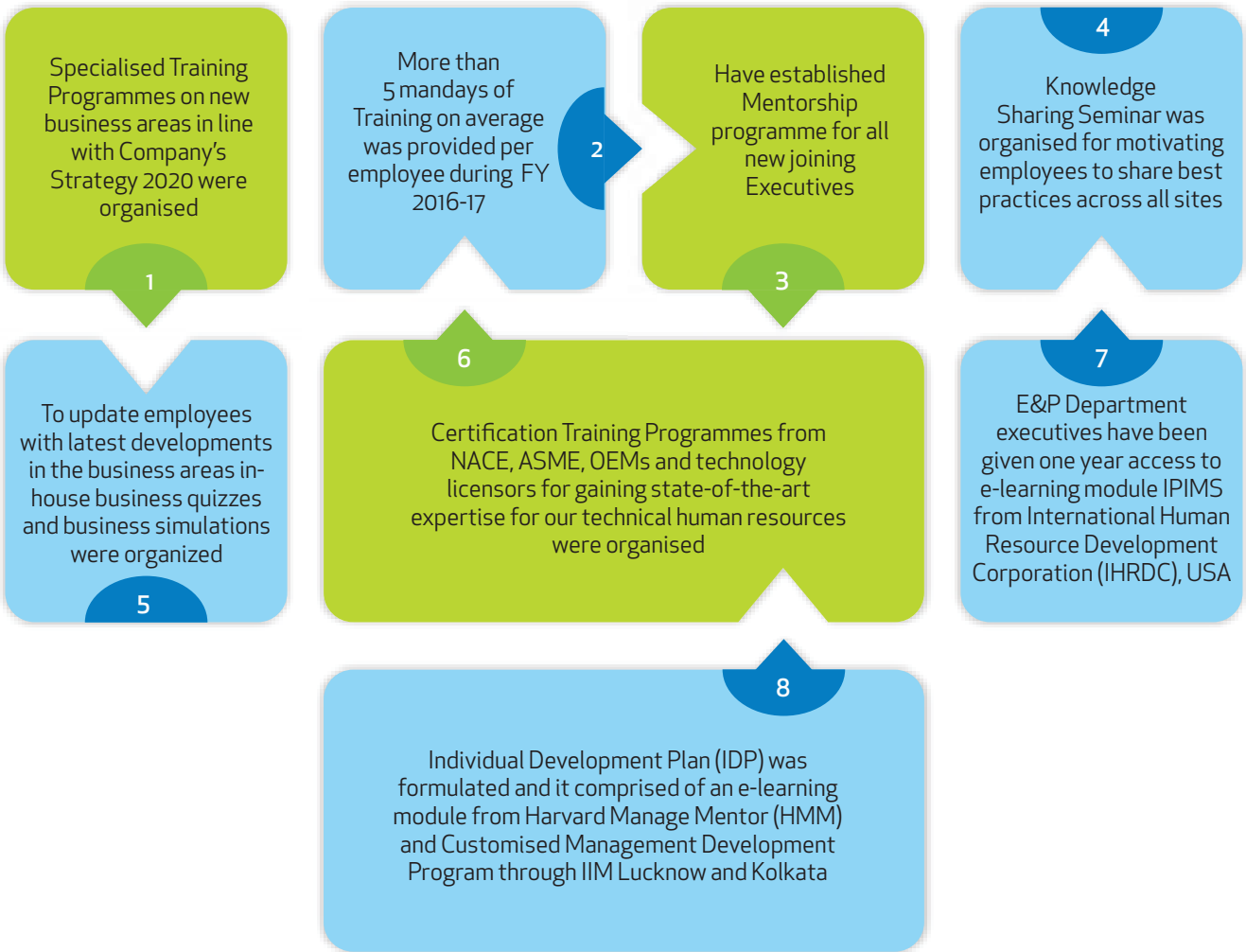


monitoring, the record notes of discussions which are help at the work centres are collated at the Corporate Office on a monthly for the Director (HR). We adhere to Section 9A of Industrial Dispute Act 1947 & Schedule 4 for providing notice period regarding significant operational changesG4-LA4. There is no operation which ran with risk related to violation of right to exercise freedom of association and collective bargaining during FY 16-17. The health and safety related subject matter relevant to contract employeesG4-LA8 is covered in the formal agreements with trade unions.

Human Rights

Building an engaged, healthy, and inclusive workforce is crucial to us. We follow the highest standards of human behaviour and maintain the reverence of all associated to us. We have zero tolerance towards any act to that leads to the violation of Human Rights. We also have a zero-tolerance policy followed for child & forced labour and ensure that no such employment occurs at any of our operations. No incident of engagement of child or forced or compulsory labour has been reported in FY 2016-17. One of our core values has been respecting and protecting human

nobility. We are a signatory to the United Nations Global Compact (UNGC) which has specific focus towards human rights. We are also committed to UN Guiding Principles on Business and Human Rights. We are one of the few organisations in the oil and natural gas sector to have implemented the SA 8000, auditable certification standards for decent workplaces. SA 8000, and is based on the UN Declaration of Human Rights (UNHR), conventions of the ILO, UN and national law was implemented at GAIL Hazira. We voluntary commit to these policies and towards human rights and





uphold them with the right intentions. The issue of human rights is central to good corporate citizenship leading to a healthy bottom-line. Our induction process comprises of training on GAIL's CDA rules to develop understanding on these aspects. Training Programs on labour laws and outsourcing conducted by GAIL Training Institute cover almost majority of aspects of Human Rights. Every year such programs are conducted as a part of annual training plan including the In-Charges of

outsourcing contracts.G4-DMA, G4-HR1, G4-HR2, G4-HR3, G4-HR5, G4-HR6, G4-HR7, G4-HR9

We comply with the Presidential Directives and other instructions/guidelines issued from time to time pertaining to Policies and Procedures of Government of India. These directives are regarding reservation, relaxations, concessions etc. for Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs) and Persons

with Disabilities (PWDs) in Direct Recruitment.

We also have a defined policy in places for prevention of sexual harassment at the work place. It is ensured by the concerned executive at every location to comply with the relevant statutes. 100% of our security personnel have been trained on specific procedures on human rights applicable to security services.

Training on Human Rights	2013-14	2014-15	2015-16	2016-17
Number of Man-hours	352	432	544	4556





Performance Snapshot

Material Consumption	Unit	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
NG Processed	MMSCM	15,120	14,373	14,529	13,584	22,060	23,726
NG to Product	MMSCM	1,137	1,080	1,058	1,112	966	1,430
Lean NG to Pipeline	MMSCM	13,419	12,944	13,203	12,044	19,515	18,880
Associated Material	MT	9,916	10,631	10,563	11,350	13,428	16,026
Packaging Material	MT	2,249	2,208	2,090	2,228	1,693	3,025
Recycled Material	MT	0	0	0	0	0	0

Energy Consumption (GJ)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Direct Energy	3,90,12,486	3,73,59,156	3,58,59,826	3,50,88,263	3,79,00,494	4,66,47,856
Indirect Energy	11,66,546	11,18,455	11,26,035	12,33,894	18,47,583	22,05,429
Renewable Energy	12,156	27,980	88,274	95,944	80,943	92,075
Energy from NG Flaring	3,37,453	3,67,375	3,47,921	3,55,781	3,91,379	5,20,210
Energy from LPG Flaring	4,923	2,472	2,889	3,035	5,240	4,914
Energy from NG Venting	1,33,305	4,44,484	4,90,193	6,26,991	6,63,733	6,27,439
Energy from LPG Venting	3,739	2,619	4,744	5,626	5,468	6,809

Energy Source (GJ)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Diesel	19,666	20,093	20,330	18,628	14,467	18,438
Natural Gas	3,10,33,613	3,00,56,464	2,89,88,285	2,81,63,438	3,21,65,593	3,63,96,411
Residual Fuel	79,56,762	72,79,523	68,49,248	69,06,178	57,20,433	1,02,33,007
LPG	2,444	3,076	1,963	18	0	0
Total Direct Energy	3,90,12,486	3,73,59,156	3,58,59,826	3,50,88,264	3,79,00,494	4,66,47,856
Total Energy Saved	11,74,650	1,52,061	55,967	5,75,362	42,987	3,954

Energy Saving (GJ)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total Energy Saved	11,74,650	1,52,061	55,967	5,75,362	42,987	3,954





GHG Saving (MTeCO ₂)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total GHG Saved	66,159	8,805	4,225	33,253	3,599	1,005

Renewable Energy Generation (GJ)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Wind	43,414	5,45,124	4,64,398	4,04,929	5,71,230	8,13,707
Solar	75	3,262	34,621	31,553	34,790	36,189
Total Renewable Energy	43,489	5,48,386	4,99,018	4,36,481	6,06,020	8,49,897

Air Emissions (Tons/Annum)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SPM	1,012	912	815	491	360	476
NO _x	695	848	968	1,482	1,318	1,770
CO	0	0	668	607	425	1,432
SO _x	193	178	304	216	133	206
VOC	0	0	2	18	12	53
R-134a	169	0	226	226	165	264

ODS Gas Consumption	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
R22 (Kg/Annum)	2,299	2,778	1,951	2,428	3,154	3,433

GHG Emissions (tCO ₂ eq)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Scope 1 Emissions	23,63,624	23,81,898	22,85,196	22,52,649	25,49,023	29,50,694
Scope 2 Emissions	2,56,278	2,56,781	2,58,538	2,80,981	4,20,835	5,05,399
Total GHG Emissions	26,19,902	26,38,679	25,43,735	25,33,629	29,69,858	35,493,35

Water (Million M ³)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total Water Consumption	14	14	13	14	17	21
Total Waste Water Generated	2.3	2.4	2	1.7	1.6	1.7
Total Waste Water Discharged	1.3	1.2	1.2	1.1	1	1.3
Water Recycled/ Reused	0.9	1.1	0.8	0.6	0.5	0.2





2014-15				2015-16			2016-17		
Type of Disposal	Solid (MT)	Liquid (Litre)	Misc (No.)	Solid (MT)	Liquid (Litre)	Misc (No.)	Solid (MT)	Liquid (Litre)	Misc (No.)
Incineration	3	0	461	6,058	0	0	6,904	0	0
Landfill	554	0	0	9	0	20	3	0	0
Onsite Storage	57	13,532	1,456	218	19,677	991	0	625	3
Recycle	1,953	9,65,924	5,636	3,549	13,94,264	8,461	3,034	3,88,058	4,464
Other	865	78,014	1,055	627	44,113	2,236	855	1,10,597	1,105

E&P-Waste Type OG7	FY 2016-17
Drilling Mud and Drill Cutting (MT)	1,415

Environmental Fine	Unit	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Show-cause Notices Received	Numbers	1	0	0	0	0	1
Environmental Fines	INR	0	0	0	0	0	0

Environmental Expenditure (in INR Million)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Treatment and Disposal of Waste	7	8	4	10	5	6
Depreciation and Maintenance Cost of Equipment Used in Pollution Control	16	16	16	85	40	11
External Services for Environmental Management	4	5	5	9	10	8
External Certification of Management Systems	1	1	1	2	1	3
Personnel for General Environmental Management Activities	20	18	17	18	31	20
Extra Expenditures for Installing Cleaner Technologies	10	1	-	29	4	19
Insurance for environmental liability	-	-	-	-	52	56
Other Environmental Costs	6	5	3	7	5	11
Total Environmental Expenditures	64	54	46	160	148	134





Health and Safety of Employees <small>G4-LA5, G4-LA6, G4-LA7, G4-LA12</small>	Unit	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Management Representatives in Safety Committees	Numbers	245	247	290	301	300	315
Non-Management Representatives in Safety Committees	Numbers	172	182	189	166	196	206
Near Miss Cases - Male	Numbers	156	156	217	316	342	411
Near Miss Cases - Female	Numbers	0	1	2	2	3	2
Minor Injuries - Male	Numbers	0	0	0	3	2	1
Minor Injuries - Female	Numbers	0	0	0	0	1	0
Reportable Injuries - Male	Numbers	0	0	4	0	1	0
Reportable Injuries - Female	Numbers	0	0	0	0	0	0
Lost Days Due to Reportable Injuries - Male	Numbers	0	0	0	0	6,045	0
Lost Days Due to Reportable Injuries - Female	Numbers	0	0	0	0	0	0
Fatalities - Male	Numbers	0	0	0	0	1	0
Fatalities - Female	Numbers	0	0	0	0	0	0
First Aid Cases - Male	Numbers	17	11	1	3	0	14
First Aid Cases - Female	Numbers	0	0	0	0	0	0
Man-hours Worked - Male	Million man-hours	6.6	5.6	7.5	6.3	6.5	6.6
Man-hours Worked - Female	Million man-hours	0	0.2	0.3	0.2	0.2	0.2
Occupational Diseases - Contract Employee - Male	Numbers	0	0	0	0	0	0
Occupational Diseases - Contract Employee - Female	Numbers	0	0	0	0	0	0
LTIFR - Male	Reportable Injuries per Million man-hours worked	0	0	.5	0	0.1	0
LTIFR - Female	Reportable Injuries per Million man-hours worked	0	0	0	0	0	0
Severity Rate - Total	Lost Days per million man-hours worked	0	0	0	0	897	0
Fatality Rate - Male	Fatalities per million man-hours worked	0	0	0	0	0	0
Fatality Rate - Female	Fatalities per million man-hours worked	0	0	0	0	0	0





Health and Safety- Contract Employees	Unit	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Near Miss Cases - Male	Numbers	208	184	229	207	198	197
Near Miss Cases - Female	Numbers	0	0	0	0	0	0
Minor Injuries - Male	Numbers	3	3	4	9	3	2
Minor Injuries - Female	Numbers	0	0	0	0	0	0
Reportable Injuries - Male	Numbers	0	0	6	8	3	0
Reportable Injuries - Female	Numbers	0	0	0	0	0	0
Lost Days Due to Reportable Injuries - Male	Numbers	0	0	12	16	6,068	0
Lost Days Due to Reportable Injuries - Female	Numbers	0	0	0	0	0	0
Fatalities - Male	Numbers	0	0	0	0	2	0
Fatalities - Female	Numbers	0	0	0	0	0	0
First Aid Cases - Male	Numbers	73	57	8	73	55	54
First Aid Cases - Female	Numbers	0	0	0	0	0	4
Manhours Worked - Male	Million Manhours	30.7	16.7	19.7	19.8	28.3	26.5
Manhours Worked - Female	Million Manhours	0	0.4	1	0.5	0.5	0.32
Occupational Diseases - Contract Employee - Male	Numbers	0	0	0	0	0	0
Occupational Diseases - Contract Employee - Female	Numbers	0	0	0	0	0	0
LTIFR - Male	Reportable Injuries per Million manhours worked	0	0	0	0	0	0
LTIFR - Female	Reportable Injuries per Million manhours worked	0	0	0	0	0	0
Severity Rate - Total	Lost Days per million manhours worked	0	0	9	2	211	0
Fatality Rate - Male	Fatalities per million manhours worked	0	0	0	0	0.07	0
Fatality Rate - Female	Fatalities per million manhours worked	0	0	0	0	0	0





Description of Incident	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Accidents (other than fire/leakage)	0	0	0	0	1	1
Fire / Leakage	0	0	3	2	1	4
No. of fatal incidents (not covered above)	0	0	0	1	0	0
No. of fatalities	0	0	0	22	3	0
Injured (all above incidents)	0	0	8	18	4	5

Permanent Employee Distribution (Numbers)G4-10	2015-16	2016-17
Senior Management (E7-E9) - Male	259	250
Senior Management (E7-E9) - Female	7	8
Middle Management (E4-E6) - Male	1,416	1,508
Middle Management (E4-E6) - Female	47	54
Junior Management (E0-E3) - Male	1,491	1,481
Junior Management (E0-E3) - Female	162	160
Non-Management (S0-S7) - Male	899	854
Non-Management (S0-S7) - Female	36	35
Senior Management (E7-E9): <30 Years Age	0	0
Senior Management (E7-E9): 30 To 50 Years Age	64	58
Senior Management (E7-E9): >50 Years Age	202	200
Middle Management (E4-E6): <30 Years Age	0	0
Middle Management (E4-E6): 30 To 50 Years Age	1,144	1,136
Middle Management (E4-E6): >50 Years Age	319	426
Junior Management (E0-E3): <30 Years Age	545	464
Junior Management (E0-E3): 30 To 50 Years Age	823	838
Junior Management (E0-E3) >50 Years Age	285	339
Non-Management (S0-S7) <30 Years Age	121	125
Non-Management (S0-S7) 30 To 50 Years Age	687	645
Non-Management (S0-S7) >50 Years Age	119	119
Employee Turnover – Management	72	76
Employee Turnover – Non-Management	9	7





Permanent Employee Distribution ^{G4-10}	2015-16	2016-17
Employee Turnover - Age<30-Male	17	29
Employee Turnover - Age<30-Female	2	5
Employee Turnover - Age: 30 To 50 Years Age -Male	13	8
Employee Turnover - Age: 30 To 50 Years Age -Female	2	3
Employee Turnover - Age >50 Years Age -Male	45	41
Employee Turnover - Age >50 Years Age -Female	2	1
New Employees Hired During FY: Male	134	107
New Employees Hired During FY: Female	2	12

Contract Employee Distribution (Numbers)	2015-16	2016-17
Security Staff Male	2,599	2,244
Security Staff Female	4	4
Regular Contract Worker Male*	15,287	15,672
Regular Contract Worker Female*	362	329

Training (Hours)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Management Employees (Direct) - Male	1,07,250	1,29,831	1,20,497	1,39,647	1,54,468	1,55,436
Management Employees (Direct) - Female	5,445	7,211	6,856	9,256	9,456	11,276
Workmen (Direct Employees) - Male	29,071	26,493	25,009	26,541	31,192	26,960
Workmen (Direct Employees) - Female	1,520	1,269	875	1,191	760	792
Contractual Labour (Operations) - Male	38,944	41,835	53,878	45,767	43,266	45,712
Contractual Labour (Operations) - Female	0	670	983	7,199	1,166	900
Permanent Employee- Physically Disabled	0	0	1,007	2,652	2,212	2,230
Contract Worker -Physically Disabled	0	0	0	4	4	0
Training for Direct Employees (GTI Noida & Jaipur Based)	1,28,160	1,44,672	1,59,906	1,94,464	1,28,160	1,44,672



Employees returned to work after parental leave FY 2016-17 G4-LA3	Gender	Nos.
Number of employees entitled to parental leave	Male	4,097
	Female	257
Number of employees that took parental leave	Male	142
	Female	18
Number of employees who returned to work after parental leave ended	Male	142
	Female	18
Employee returned to work after parental leave ended who were still employed 12 months after their return	Male	141
	Female	18
Retention rates of employees who returned to work after parental leave ended	Male	100
	Female	100

	Reserve TypeOG1	Unit	As on 31st March, 2017
Total E&P Reserves	Gas	MMSCM	6,384
Developed	Gas	MMSCM	4,524
Undeveloped	Gas	MMSCM	1,860

Emission Calculation Methodology

Total Scope-1 Emissions have been calculated based on the IPCC Emission Factors and internal Process Calculations. Emissions have been identified from different sources of fuel and direct CO2 emissions. Total Scope-2 Emissions have been calculated by weighted average grid Emission factors given by Central Electricity Authority, Government of India for Unified Grid.

The Guidelines used are GHG Protocol, ISO 14064. Direct & Indirect Energy from different fuels, renewables, and electricity have been calculated by the corresponding calorific value of the fuel and theoretical thermal equivalence respectively. NOx, SOx, SPM, CO, VOC have been reported by Test Report data and standard calculation formula.





DNV GL

Independent Assurance Statement

Scope and approach

DNV GL represented by DNV GL Business Assurance India Private Limited ('DNV GL') has been commissioned by the management of GAIL (India) Limited ('GAIL' or 'the Company') to undertake independent assurance of the Company's Sustainability Report 2016-17 in its printed format (the 'Report') for the Financial year ended 31st March' 2017. Our responsibility in performing this work is regarding verification of Sustainability performance disclosed in the Report and in accordance with the agreed scope of work with the management of the Company. The intended users of this assurance statement are the management of the Company. Our assurance engagement was planned and carried out during June and July' 2017.

We performed our work using DNV GL's assurance methodology VeriSustainTM1, which is based on our professional experience, international assurance best practice including International Standard on Assurance Engagements (ISAE) 3000 Revised*, along with AccountAbility's AA1000 Assurance Standard 2008 ((AA1000AS (2008)) and the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines Version 4 (GRI G4) including the Oil and Gas Sector Disclosures (OGSD).

The agreed scope of work was the verification of the qualitative and quantitative information on sustainability performance disclosed in the Report covering Economic, Environmental and Social performance of the activities undertaken by the Company over the Reporting period 1st April' 2016 to 31st March' 2017 and based on the GRI G4. We understand that the reported financial data and information are based on data from Company's Report and Account for year ending 31st March' 2017, which are subject to a separate independent audit process. The review of Financial and CSR expenditure data taken from the Annual Report and Accounts is not within the scope of our work. We planned and performed our work to obtain the evidence we considered necessary to provide a basis for our assurance opinion and no external stakeholders were interviewed as part of this assurance engagement.

Responsibilities of the Management of GAIL (India) Limited and of the Assurance Providers

The Management team of Company have sole responsibility for the preparation of the Report and responsible for all information provided in the Report as well as the processes for collecting, analysing and reporting the information presented in the printed Report.

In performing our assurance work, our responsibility is to the management of Company; however, our statement represents our independent opinion and is intended to inform outcome of our assurance to the stakeholders of Company.

DNV GL provides a range of other services to GAIL, none of which constitute a conflict of Interest with this assurance work. This is the fourth year that we have provided assurance of the GAIL's Sustainability Report.

DNV GL's assurance engagements are based on the assumption that the data and information provided by GAIL to us as part of our review have been provided in good faith. DNV GL was not involved in the preparation of any statements or data included in the Report except for this Assurance Statement. DNV GL expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Assurance Statement.

Basis of our opinion

A multi-disciplinary team of sustainability and assurance specialists performed work at Corporate office and Site Levels of Company. We undertook the following activities:

- Review of the current sustainability issues that could affect Company's sustainability performance and are of interest to identified stakeholders;
- Review of GAIL approach to stakeholder engagement and recent outputs although we have no direct engagement with stakeholders;
- Review of information provided to us by Company on its reporting and management processes relating to the Principles;
- Interviews with selected Directors, Leadership team, and Senior managers responsible for management of sustainability issues and review of selected evidence to support issues discussed. We were free to choose interviewees and interviewed those with overall responsibility for the programmes to deliver the GAIL's Sustainability Aspirations 2020 for medium and long term Vision, Mission and milestones;
- Site visits were conducted in GAIL's Corporate Office at New Delhi, GAIL Training Institute (GTI) and Jubilee Tower at Noida, Jamnagar Loni Pipeline (JLPL) Head Quarters at Jaipur and five operational sites located in India i.e. Petrochemical Plant at Pata (U.P.), Gas Processing Unit and Compressor Station at Vijaipur (M.P.), LPG Pumping and receiving station at Mansarampura, Jaipur (Rajasthan), Natural Gas Compressor Station at Khera, near Indore (M.P.) and Liquefied Gas Processing Unit at Vizag (Andhra Pradesh) to review process and systems for preparing site level sustainability data;
- The sites we visited were selected based on their materiality to the group for environmental impacts as well as to give a geographical and divisional spread;
- Review of supporting evidence for key claims and data in the Report. Our checking processes were prioritised according to materiality and we based our prioritisation on the materiality of issues at a consolidated corporate level;
- Review of the processes for gathering and consolidating the specified performance data and
- An independent assessment of reporting against the Global Reporting Initiative (GRI) G4 Guidelines and the Oil and Gas Sector Disclosures (OGSD).

During the assurance process, we did not come across limitations to the scope of the agreed assurance engagement, except disclosures related to Joint ventures, subsidiaries, leased facilities, outsourced operations, and other entities which are out of boundary as set out in the Report.

Opinion

On the basis of the work undertaken, nothing came to our attention to suggest that the Report does not properly describe, adherence to GRI G4 content Principles, General Standard Disclosure and Specific Standard Disclosures for 'in accordance' – Core option of reporting as below:

- a. **General Standard Disclosures:** The reported information on General Standard Disclosure along with the referenced information generally meets the disclosure requirements for 'in accordance' – Core option of reporting.
- b. **Specific Standard Disclosures:** The Report describes the Generic Disclosures on Management Approach (DMA) and Performance Indicators for identified material Aspects as below:

Economic

- Economic Performance – G4-EC1, EC3, EC4;
- Indirect Economic Impacts and Community Development- G4- EC7, EC8;
- Procurement Practices- G4-EC9;

¹The VeriSustain protocol is available on dnvgl.com.

*Assurance Engagements other than Audits or Reviews of Historical Financial Information.





Environmental

- Materials – G4-EN1;
- Energy – G4-EN3, EN5, EN6; OG2, OG3;
- Water – G4-EN8, EN9, EN10;
- Emissions – G4-EN15, EN16, EN18, EN19, EN20, EN21, OG6;
- Effluents and Waste – G4-EN21, EN22, EN23, EN24;
- Compliance – G4-EN29;

Social

Labour Practices and Decent Work

- Employment – G4-LA1, LA2 & LA3;
- Labor and Management Relationship – G4-La4;
- Occupational Health and Safety – G4-LA5, LA6, LA7 & La8;
- Training and Education – G4-LA9, LA10 & La11;
- Diversity and Equal Opportunity – G4-LA12;
- Equal Remuneration for Women and Men – G4-La13;
- Supplier Assessment of Labour Practices – G4-LA14 & La15;
- Labour Practices Grievance Mechanisms – G4-LA16;

Human Rights

- Investment- G4- HR1 & Hr2;
- Non-discrimination – G4-HR3;
- Freedom of Association and Collective Bargaining – G4-HR4;
- Child Labor- G4-HR5;
- Forced and Compulsory Labor – G4- Hr6;
- Security Practices – G4-HR7;
- Indigenous Rights- GR-HR8;
- Assessment- G4- Hr9;
- Supplier Human Rights Assessment – G4-HR10 & Hr11;
- Human Rights Grievance Mechanisms – G4-HR12;

Society

- Local Communities –G4-SO1 & So2;
- Anti-corruption – G4-SO3, SO4 & So5;
- Public Policy- G4-SO6;
- Anti-Competitive Behaviour- G4-SO7;
- Compliance – G4-SO8;
- Supplier Assessment for Impacts on Society – G4-SO9 & So10;
- Grievance Mechanisms for Impact on Society- G4-SO11;
- Asset Integrity and Process Safety- Og13;

Product Responsibility

- Customer Health and Safety- G4-PR2;
- Product and Service Labelling – G4-PR3,PR4 & PR5;
- Marketing Communications- G4-PR6 & Pr7;
- Customer Privacy – G4-PR8;
- Compliance – G4-PR9.

Observations

Without affecting our assurance opinion we also provide the following observations. We have evaluated the Report's adherence to the following principles on a scale of 'Good', 'Acceptable' and 'Needs Improvement':

AA1000AS (2008) Principles

Inclusivity

The participation of stakeholders in developing and achieving an accountable and strategic response to Sustainability.

The stakeholder engagement process is well established to identify sustainability challenges and concerns of diverse stakeholder groups considering the GAIL Operations businesses and the Report brings out key concerns of diverse stakeholders like Health and Safety issues, Gas and Petrochemicals Marketing, Transparency and Ethics, Waste Management and Operational Efficiency. The stakeholder concerns are well identified, documented and reported. In our opinion, the level at which the Report adheres to this principle is 'Good'.

Materiality

The process of determining the issues that are most relevant to an organization and its stakeholders

The materiality determination process was revalidated based on inputs from key stakeholders including employees, customers, suppliers, NGOs, governments, regulatory





bodies, local communities and senior management of Company and has not missed out key material issues from the Oil and Gas Sector. The management of the Company has established internal assessment process for monitoring and management on a continual basis for their long term organisational sustainability. In our opinion, the level at which the Report adheres to this principle is 'Good'.

Responsiveness

The extent to which an organization responds to stakeholder issues.
The Report has brought out key responses to the materiality aspects in a comprehensive manner for stakeholder to make informed decisions and adequately disclosed the strategies and management approach related to identified key sustainability aspects and challenges considering the overall sustainability context of the Oil & gas sector, within the identified aspect boundary. In our opinion, the level at which the Report adheres to this principle is 'Acceptable'.

Reliability

The accuracy and comparability of information presented in the report, as well as the quality of underlying data management systems.
The majority of data and information verified at the Corporate Office, Jubilee Tower and GTI, Noida and five operational sites were found to be accurate and nothing came to our attention to suggest that reported data have not been properly collated from information reported at operational level, nor that the assumptions used were inappropriate. Some of the data inaccuracies identified during the verification process were found to be attributable to transcription, interpretation and aggregation errors and the errors have been communicated for correction. Hence in accordance with AA1000AS (2008) requirements for a Type 2, moderate level assurance engagement, we conclude that the specified sustainability data and information presented in the Report is generally reliable. In our opinion, the level at which the Report adheres to this principle is 'Good'.

Specific Evaluation of the information on Sustainability Performances

We consider the methodology and process for gathering information developed by the Company for its sustainability performance reporting to be appropriate and the qualitative and quantitative data include in the Report was found to be identifiable and traceable; the personnel responsible were able to demonstrate the origin and interpretation of the data and its reliability. We observed that the report presents a faithful description of the Company's sustainability activities.

Additional Parameters as per DNVGL's VeriSustain Protocol

Completeness

How much of all the information that has been identified as material to the organisation and its stakeholders is reported
The Report has fairly attempted to disclose the General and Specific Standard disclosures including the disclosure on management approach and performance indicators for identified material aspects for GRI G4 – 'In accordance' – Core option. The reporting of performance and data is comprehensive except for certain material aspects as systems to report the performance indicators are being established and set the internal time lines for disclosure. Hence in our opinion, the level at which the Report adheres to this principle is 'Acceptable'.

Neutrality

The extent to which a report provides a balanced account of an organization's performance, delivered in a neutral tone.
The disclosures related to sustainability issues and performances are reported in a neutral tone, in terms of content and presentation, however Report could further bring out responses related to the challenges faced during the reporting period at various geographical locations of operations in terms of disclosure of all identified material aspects, sustainability goals and targets etc. In our opinion, the level at which the Report adheres to this principle is 'Acceptable'.

Opportunities for Improvement

The following is an excerpt from the observations and opportunities for improvement reported to the management of the Company and are not considered for drawing our conclusions on the Report; however they are generally consistent with the management's objectives:

- Future reports may bring out the impacts of material aspects in the Value Chain, Joint Ventures and Subsidiaries and disclose sustainability performance i.e. re-evaluate materiality for all entities included in its financial statement and extend the reporting boundary;
- Report may also disclose the year on year performance on Sustainable Development Goals 2030 as part of key performance indicators to achieve sustainable performance across geo locations of the Company;
- Sustainability performance may be benchmarked across geo-locations for review and monitoring based on long term Sustainability targets;
- May explore adoption of sustainability practices based on best practices of On and Gas industry and peers in industry for strengthening the existing sustainability practices and its associated business impacts.

For and on behalf of DNV GL

Ramesh Rajamani Lead Verifier, DNV GL – Business Assurance India Private Limited	Vallabharath Nandkumar Assurance Reviewer, Regional Manager – Regional Sustainability Operations – Region India and Middle East, DNV GL – Business Assurance India Private Limited

New Delhi, India, 10th July 2017



DNV GL Business Assurance India Private Limited is part of DNV GL – Business Assurance, a global provider of certification, verification, assessment and training services, helping customers to build sustainable business performance. www.dnvgl.com





Glossary

API	American Petroleum Institute	IT	Information Technology	OBC	Other Backward Classes
ASME	American Society of Mechanical Engineers	IL&FS	Infrastructure Leasing and Financial Services	NOx	Oxides of nitrogen
CPCB	Central Pollution Control Board	IMS	Integrated Management System	SOx	Oxides of Sulphur
CPSE	Central Public Sector Enterprise	IPIECA	Formerly - International Petroleum Industry Environmental Conservation Association	ODS	Ozone Depleting Substances
CVC	Central Vigilance Commission	JLPL	Jamnagar Loni Pipe Line	PNGRB	Petroleum and Natural Gas Regulatory Board
CMD	Chairman and Managing Director	JV	Joint Ventures	PPAC	Petroleum Planning and Analysis Cell
CFC	Chloro-fluoro Carbons	KG	Krishna-Godavari	PNG	Piped Natural Gas
CGD	City Gas Distribution	LPG	Liquefied Petroleum Gas	PCB	Pollution Control Board
CRZ	Coastal Regulation Zone	LHC	Liquid Hydro Carbon	PE	Poly-Ethylene
CAGR	Compounded Annual Growth Rate	LP	Low Polymer	PAT	Profit After Tax
CNG	Compressed Natural Gas	MDG	Millennium Development Goals	PPP	Public Private Partnership
CSR	Corporate Social Responsibility	MBA	Masters of Business Administration	RGPL	Ratnagiri Gas and Power Private Limited
CSI	Customer Satisfaction Index	MoU	Memorandum of Understanding	RLNG	Re-gasified Liquid Natural Gas
DVPL	Dahej-Vijaipur Pipe Line	MT	Metric Tons	R&D	Research and Development
DGM	Deputy-General Manager	MMSCMD	Million Metric Standard Cubic Meter per Day	RTI	Right To Information
DGH	Directorate-General of Hydrocarbons	MoEF & CC	Ministry of Environment, Forests & Climate Change	SPM	Suspended Particulate Matter
		MoP&NG	Ministry of Petroleum and Natural Gas	SD	Sustainable Development
EPA	Environmental Protection Agency	MoRD	Ministry of Rural Development	TERI	The Energy and Resources Institute
ED	Executive Director	MFO	Mixed Fuel Oil	TMT	Thousand Metric Tons
E&P	Exploration and Production	NCR	National Capital Region	tCO ₂ e	Tons of Carbon Dioxide equivalent





FY	Financial Year	NH	National Highways	TPA	Tons per Annum
GTI	GAIL Training Institute	NIT	National Institute of Technology	TDS	Total Dissolved Solids
GPU	Gas Processing Unit	NG	Natural Gas	UNGC	United Nations Global Compact
GJ	Giga-Joule	NGO	Non-Government Organizations	VSPL	Vizag-Secundrabad Pipe Line
GRI	Global Reporting Initiative	OHSAS	Occupational Health and Safety Assessment Series		
GHG	Green-house Gas	ONGC	Oil and Natural Gas Corporation		
HVJ	Hazira-Vijaipur-Jagdishpur	OISD	Oil Industry Safety Directorate		
HSE	Health, Safety and Environment	OMC	Oil Marketing Companies		





GRI Content Index



General Standard Disclosures	Page	External Assurance
Section: Strategy and Analysis		
G4-1	18-CMD Message	Yes; 140- Independent Assurance Statement
G4-2	18-CMD Message	
Section: Organizational Profile		
G4-3	GAIL (India) Limited	Yes; 140- Independent Assurance Statement
G4-4	23-About GAIL	
G4-5	21-About the Report, New Delhi, India	
G4-6	23- About GAIL, 6-11- GAIL Annual Report FY 2015-16 http://www.gailonline.com/final_site/IZ-AnnualReports.html	
G4-7	GAIL is a Central Public Sector Enterprise, listed on BSE, NSE and Global depository receipt (GDR) on London Stock Exchange	
G4-8	23- About GAIL, 6-11-GAIL Annual Report FY 2015-16 http://www.gailonline.com/final_site/IZ-AnnualReports.html	
G4-9	23- About GAIL, 6-11- GAIL Annual Report FY 2015-16 http://www.gailonline.com/final_site/IZ-AnnualReports.html ; 90-Business Growth and Profitability	
G4-10	127-Human Capital and Practices; 137- Performance Snapshot	
G4-11	125, 129 -Human Capital and Practices	
G4-12	23- About GAIL; 94-Business Growth & Profitability	
G4-13	21- About the Report	
G4-14	29, 32-Corporate Governance and Management	
G4-15	113-Stakeholder Relationship Management	
G4-16	113-Stakeholder Relationship Management; 103-Public Policy and Advocacy	
Section: Identified Material Aspects & Boundaries		
G4-17	23- About GAIL, 6-11-GAIL Annual Report FY 2015-16 http://www.gailonline.com/final_site/IZ-AnnualReports.html	Yes; 140- Independent Assurance Statement
G4-18	23- About GAIL	
G4-19	45, 51-Stakeholder Engagement and Materiality	
G4-20	45, 51-Stakeholder Engagement and Materiality	
G4-21	45, 51-Stakeholder Engagement and Materiality	
G4-23	21-About the Report	
Section: Stakeholder Engagement		
G4-24	45-Stakeholder Engagement and Materiality	Yes; 140- Independent Assurance Statement
G4-25	45-Stakeholder Engagement and Materiality	
G4-26	45-Stakeholder Engagement and Materiality	
G4-27	45-Stakeholder Engagement and Materiality	





General Standard Disclosures	Page	External Assurance
Section: Report Profile		
G4-28	Financial Year 15-16; 21-About the Report	Yes; 140- Independent Assurance Statement
G4-29	This is GAIL's 7th Sustainability Report (SR). The 6th SR was released on 23rd September 2016.	
G4-30	Annual	
G4-31	154-Way Forward	
G4-32	21-About the Report	
G4-33	21-About the Report	
Section: Governance		
G4-34	29-Corporate Governance and Risk Management, GAIL Annual Report FY 2016-17	Yes; 140- Independent Assurance Statement
G4-35	29-Corporate Governance and Risk Management	
G4-36	29-Corporate Governance and Risk Management	
G4-37	38-Corporate Governance and Risk Management; 110-Public Policy and Advocacy	
G4-38	29-Corporate Governance and Risk Management	
G4-39	29-Corporate Governance and Risk Management	
G4-40	29-Corporate Governance and Risk Management	
G4-41	30-Corporate Governance and Risk Management	
G4-42	29, 30-Corporate Governance and Risk Management	
G4-43	29, 30-Corporate Governance and Risk Management	
G4-44	29-Corporate Governance and Risk Management	
G4-45	11-Corporate Governance and Risk Management	
G4-46	11-Corporate Governance and Risk Management	
G4-47	11-Corporate Governance and Risk Management	
G4-48	10-Corporate Governance and Risk Management	
G4-49	16-Corporate Governance and Risk Management	
G4-50	16-Corporate Governance and Risk Management	
G4-51	30-Corporate Governance and Risk Management	
G4-52	30-Corporate Governance and Risk Management	
G4-53	30-Corporate Governance and Risk Management	
G4-54	30-Corporate Governance and Risk Management	
G4-55	30-Corporate Governance and Risk Management	
Section: Ethics & Integrity		
G4-56	36-Corporate Governance and Risk Management	Yes; 140- Independent Assurance Statement
G4-57	36-Corporate Governance and Risk Management	
G4-58	36-Corporate Governance and Risk Management	





Specific Standard Disclosures

Material Aspects	DMA and Indictors	Page	Omissions	External Assurance
Category: Economic				
Economic Performance	G4-DMA	89-Business Growth and Profitability		Yes; 140- Independent Assurance Statement
	G4-EC1	89-Business Growth and Profitability		
	G4-EC2	32-Corporate Governance and Risk Management, 66-Operational Excellence		
	G4-EC3	129-Human Capital and Practices		
	G4-EC4	90-Business Growth and Profitability		
Indirect Economic Impacts	G4-DMA	119-Stakeholder Relationship Management		
	G4-EC7	119-Stakeholder Relationship Management		
	G4-EC8	119-Stakeholder Relationship Management		
	OG1	139-Performance Snapshot		
Procurement Practices	G4-DMA	117-Stakeholder Relationship Management		
	G4-EC9	118-Stakeholder Relationship Management		
Category: Environment				
Materials	G4-DMA	39, 42-Operational Excellence		Yes; 140- Independent Assurance Statement
	G4-EN1	132-Performance Snapshot		
	G4-EN2	132-Performance Snapshot		
Energy	G4-DMA	57-Operational Excellence		
	OG2	66-Operational Excellence		
	OG3	132-Performance Snapshot		
	G4-EN3	132-Performance Snapshot		
	G4-EN4	66-Operational Excellence		
	G4-EN5	18-Sustainability Strategy		
	G4-EN6	132-Performance Snapshot		
	G4-EN7	66-Operational Excellence		
Water	G4-DMA	68-Operational Excellence		
	G4-EN8	68-Operational Excellence		
	G4-EN9	68-Operational Excellence		
	G4-EN10	132-Performance Snapshot		
Biodiversity	G4-DMA	70-Operational Excellence		
	OG4	70-Operational Excellence		
	G4-EN11	70-Operational Excellence		
Emissions	G4-DMA	66-Operational Excellence		
	G4-EN15	66-Operational Excellence		





Material Aspects	DMA and Indictors	Page	Omissions	External Assurance	
Emissions	G4-EN16	66-Operational Excellence		Yes; 140- Independent Assurance Statement	
	G4-EN17	66-Operational Excellence			
	G4-EN18	41-Sustainability Strategy			
	G4-EN19	66-Operational Excellence; Performance Snapshot			
	G4-EN20	132-Performance Snapshot			
	G4-EN21	132-Performance Snapshot			
Effluents & Waste	G4-DMA	69-Operational Excellence			
	G4-EN22	132-Performance Snapshot			
	OG5	132-Performance Snapshot			
	G4-EN23	132-Performance Snapshot			
	OG6	132-Performance Snapshot			
	OG7	134-Operational Excellence			
	G4- EN24	No significant Spills			
	G4- EN25	69-Operational Excellence			
G4- EN26	There is no significant impact of our wastewater discharge and runoffs to water bodies located in the vicinity of our operations				
Compliance	G4-DMA	29-Corporate Governance and Risk Management; 55-Operational Excellence; 110-Public Policy and Advocacy			
	G4-EN29	132-Performance Snapshot			
Transport	G4-DMA	55-Operational Excellence			
	G4-EN30	66-Operational Excellence; Most of our product distribution is undertaken through pipelines which forms a part of Scope 2 emissions			
Overall	G4-DMA	55-Operational Excellence			
	G4-EN31	132-Performance Snapshot			
Supplier Environmental Assessment	G4-DMA	33-Stakeholder Relationship Management			
	G4-EN32	100% of the new suppliers have been screened through Environmental Criteria			
	G4-EN33	118-Stakeholder Relationship Management			
Environmental Grievance Mechanisms	G4-DMA	38-Corporate Governance and Risk Management			
	G4-EN34	38-Corporate Governance and Risk Management			
Category: Social					
Sub Category: Labour Practices and Decent Work					
Employment	G4-DMA	126-Human Capital and Practices			





Material Aspects	DMA and Indictors	Page	Omissions	External Assurance
	G4-LA1	126-Human Capital and Practices		Yes; 140- Independent Assurance Statement
	G4-LA2	129-Human Capital and Practices		
	G4-LA3	139-Performance Snapshot		
Labour Management Relations	G4-DMA	129-Human Capital and Practices		
	G4-LA4	130-Human Capital and Practices		
	G4-DMA	80-Health & Safety		
Occupational Health and Safety	G4-LA5	135-Performance Snapshot		
	G4- LA6	135-Performance Snapshot		
	G4- LA7	135-Performance Snapshot		
	G4- LA8	130-Human Capital and Practices		
Training and Education	G4-DMA	128-Human Capital and Practices		
	G4- LA9	128-Human Capital and Practices		
	G4- LA10	128-Human Capital and Practices		
	G4- LA11	128-Human Capital and Practices		
Diversity and Equal Opportunity	G4-DMA	129-Human Capital and Practices		
	G4- LA12	135-Performance Snapshot		
Equal Remuneration for Men and Women	G4-DMA	129-Human Capital and Practices		
	G4-LA13	129-Human Capital and Practices		
Supplier Assessment for Labour Practices	G4-DMA	116-Stakeholder Relationship Management		
	G4-LA14	118-Stakeholder Relationship Management		
	G4-LA15	117-Stakeholder Relationship Management		
Labour Practices Grievance mechanism	G4-DMA	39-Corporate Governance and Risk Management		
	G4-LA16	39-Corporate Governance and Risk Management		
Category: Social				
Sub Category: Human Rights				
Human Rights Investment	G4-DMA	131-Human Capital and Practices		
	G4-HR1	131-Human Capital and Practices		
	G4-HR2	131-Human Capital and Practices		
Non-Discrimination	G4-DMA	131-Human Capital and Practices		
	G4-HR3	131-Human Capital and Practices		
Freedom of Association	G4-DMA	129-Human Capital and Practices		
	G4-HR4	129-Human Capital and Practices		





Material Aspects	DMA and Indictors	Page	Omissions	External Assurance	
Child Labour	G4-DMA	131-Human Capital and Practices		Yes; 140- Independent Assurance Statement	
	G4-HR5	131-Human Capital and Practices			
Forced or Compulsory Labour	G4-DMA	131-Human Capital and Practices			
	G4-HR6	131-Human Capital and Practices			
Security Practices	G4-DMA	131-Human Capital and Practices			
	G4-HR7	131-Human Capital and Practices			
Indigenous Rights	G4-DMA	119-Stakeholder Relationship Management			
	G4-HR8	119-Stakeholder Relationship Management			
Assessment	G4-DMA	119-Human Capital and Practices			
	G4-HR9	131-Human Capital and Practices;			
Supplier Human Rights Assessment	G4-DMA	117-Stakeholder Relationship Management			
	G4-HR10	118-Stakeholder Relationship Management			
	G4-HR11	117-Stakeholder Relationship Management			
Human Rights Grievance Mechanisms	G4-DMA	39-Corporate Governance and Risk Management			
	G4-HR12	39-Corporate Governance and Risk Management			
Category: Social					
Sub Category: Society					
Local Communities	G4-DMA	119-Stakeholder Relationship Management		Yes; 140- Independent Assurance Statement	
	G4-S01	119-Stakeholder Relationship Management			
	G4-S02	83-Health and Safety; 119-Stakeholder Relationship Management			
	OG10	We did not have any incidents of significant disputes with local communities and indigenous people			
	OG11	Nil			
Anti-corruption	G4-DMA	37-Corporate Governance and Risk Management			
	G4-S03	37-Corporate Governance and Risk Management			
	G4-S04	37-Corporate Governance and Risk Management			
	G4-S05	37-Corporate Governance and Risk Management			
Public Policy	G4-DMA	103-Public Policy and Advocacy;			
	G4-S06	90-Business Growth and Profitability			





Material Aspects	DMA and Indictors	Page	Omissions	External Assurance
Anti-competitive Behavior	G4-DMA G4-SO7	110-Public Policy and Advocacy 110-Public Policy and Advocacy		
Compliance	G4-DMA G4-SO8	29-Corporate Governance and Risk Management; 55- Operational Excellence; 110-Public Policy and Advocacy 110-Public Policy and Advocacy		
Supplier Assessment for Impact on Society	G4-DMA G4-SO9 G4-SO10	117-Stakeholder Relationship Management 118-Stakeholder Relationship Management 117-Stakeholder Relationship Management		
Grievance Mechanisms for Impact on Society	G4-DMA G4-SO11	39-Corporate Governance and Risk Management 39-Corporate Governance and Risk Management		
Asset Integrity and Process Safety	G4-DMA OG13	57-Operational Excellence 79-Health and Safety		
Category: Social				
Sub Category: Product Responsibility				
Customer Health & Safety	G4-DMA G4-PR1 G4-PR2	Human Capital and Practices; 119-Stakeholder Relationship Management 119-Stakeholder Relationship Management 119-Stakeholder Relationship Management		
Product and Service labelling	G4-DMA G4-PR3 G4-PR4 G4-PR5	119-Stakeholder Relationship Management 119-Stakeholder Relationship Management 119-Stakeholder Relationship Management 73-Stakeholder Relationship Management		Yes; 140- Independent Assurance Statement
Marketing and Communications	G4-DMA G4-PR6 G4-PR7	119-Stakeholder Relationship Management There is no sale of banned or disputed products by the company 111-Public Policy and Advocacy		
Compliance	G4-DMA G4-PR9	35-Stakeholder Relationship Management 111-Public Policy and Advocacy		





Linkages with NVG SEE Principles

Principle No.	NVG-SEE	Linkages with sustainability Report FY 2016-17 sections
1	Businesses should conduct and govern themselves with Ethics, Transparency, and Accountability	Corporate Governance and Risk Management
2	Businesses should provide goods and services that are safe and contribute to sustainability throughout their life cycle	Stakeholder relationship management
3	Businesses should promote the wellbeing of all employees	Human Capital & Practices
4	Businesses should respect the interests of, and be responsive towards all stakeholders, especially those who are disadvantaged, vulnerable and marginalized.	Stakeholder relationship management
5	Businesses should respect and promote human rights	Human Capital & Practices
6	Business should respect, protect, and make efforts to restore the environment	Operational excellence
7	Businesses, when engaged in influencing public and regulatory policy, should do so in a responsible manner	Public Policy and Advocacy
8	Businesses should support inclusive growth and equitable development	Business growth and profitability
9	Businesses should engage with and provide value to their customers and consumers in a responsible manner	Stakeholder relationship management





Linkages to API/IPIECA, UNGC, ISO 26000 Principles

Section	API/IPIECA Guidelines	UNGC Principles	ISO 26000:2010 Clause
Corporate Governance & Risk Management	SE 11, SE 12	Principle 10, Principle 7	4.4, 6.2, 6.3.6, 6.6.1-6.6.3, 6.6.6, 6.8.1-6.8.2, 7.4.3, 7.7.5
Sustainability Strategy	E1, E2, E6	Principle 7, Principle 8, Principle 9	4.7, 6.5.4-6.5.5, 7.4.2
Stakeholder Engagement and Materiality	SE1, SE16	Principle 1	4.5, 5.2-5.3, 7.3.2-7.3.4
Stakeholder Relationship Management	SE1, SE2, SE4, Se14, HS4, SE14, HS1, Hs2	Principle 6, Principle 7, Principle 8	4.6, 6.3.4, 6.3.6-6.3.9, 6.4.4, 6.5.1-6.5.3, 6.5.5, 6.6.6, 6.6.7, 6.7.1-6.7.6, 6.7.8-6.7.9, 6.8, 6.8.1-6.8.3, 6.8.7-6.8.9, 7.5.3, 7.6.2, 7.8
Operational Excellence	E1, E2, E3, E4, E5, E6, E7, E8, E9, E10	Principle 8, Principle 9	6.5.4-6.5.5, 6.6.6
Human Capital & Practices	SE6, SE8, SE10, Se15, SE16, SE17, Se18	Principle1, Principle 2, Principle3, Principle 4, Principle 5, Principle 6	4.8, 6.3.1-6.3.8, 6.3.10, 6.5.1, 6.4.3-6.4.7, 6.6.6, 6.8.4-6.8.5
Health and Safety	HS1, HS2, HS3, HS5	Principle 6	6.3.9, 6.5.3, 6.8
Public Policy and Advocacy	SE14	Principle 10	4.6, 6.6.1-6.6.2, 6.6.5, 6.6.7
Business Growth & Profitability	SE4, SE5, SE7, SE13	Principle 9	6.6.1-6.6.2, 6.6.4, 6.8.1-6.8.3, 6.8.7, 6.8.9
Performance Snapshot	E1, E2, E3, E4, E6, E7, E8, E10, HS3	Principle 7, Principle 8, Principle 9	4.6, 6.2.3, 6.3.7, 6.3.10, 6.4.3, 6.4.6, 6.5.3-6.5.5, 6.8.8





Way Forward

Energy enables from job creation to economic development, from security concerns to empowerment, energy lies at the heart of the Sustainable Development Goals. Energy is woven into the fabric of human life at all levels, and all people and all nations need access to energy to grow and prosper. In the words of UN Secretary-General Ban Ki-moon, "Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive". The crippling lack of access to sustainable energy services is important to be addressed at this point in time. More than one billion people in the world today have no access to electricity, and nearly three times that number depend for cooking on solid fuels, whose smoke is killing more than four million people a year. There is a pressing need to rethink radically the way we produce, distribute, and use energy, to meet the dual challenge of reducing the carbon intensity of energy while making it available to everyone.

India is the 3rd largest consumer of energy in the world. Natural Gas is the natural choice for green economy on comparison with other fossil fuels. Role of Gas should be realised to enable an orderly energy transition that strengthens energy security, stimulates economic growth, and enhances healthy energy market functioning, prosperity, and well-being globally. Natural gas is fast becoming a global commodity like oil, with increasing share of LNG. Time has come to drive cohesive efforts to move India towards a low carbon natural gas based economy. We will look forward to developing new markets to increase share of Natural Gas in primary energy mix from current 6.5% to 15% by 2030.

We are focusing on the last mile connectivity and thus working towards the pipeline infrastructure expansion in East, North-East and Southern regions, CGD expansion through JVs / subsidiaries for additional 40-60 cities, developing green corridor by setting up of CNG stations on National Highways/State Highways, setting up LNG regasification terminals & booking re-gas capacities, sourcing through transnational pipelines, focusing on Returns through disciplined capital investment and sustainable cost efficiency and capturing opportunities in the energy's transition to a low-carbon economy

We endeavor to be an Integrated Hydrocarbon Major with significant upstream & downstream presence

We look forward to your constructive inputs towards this report.

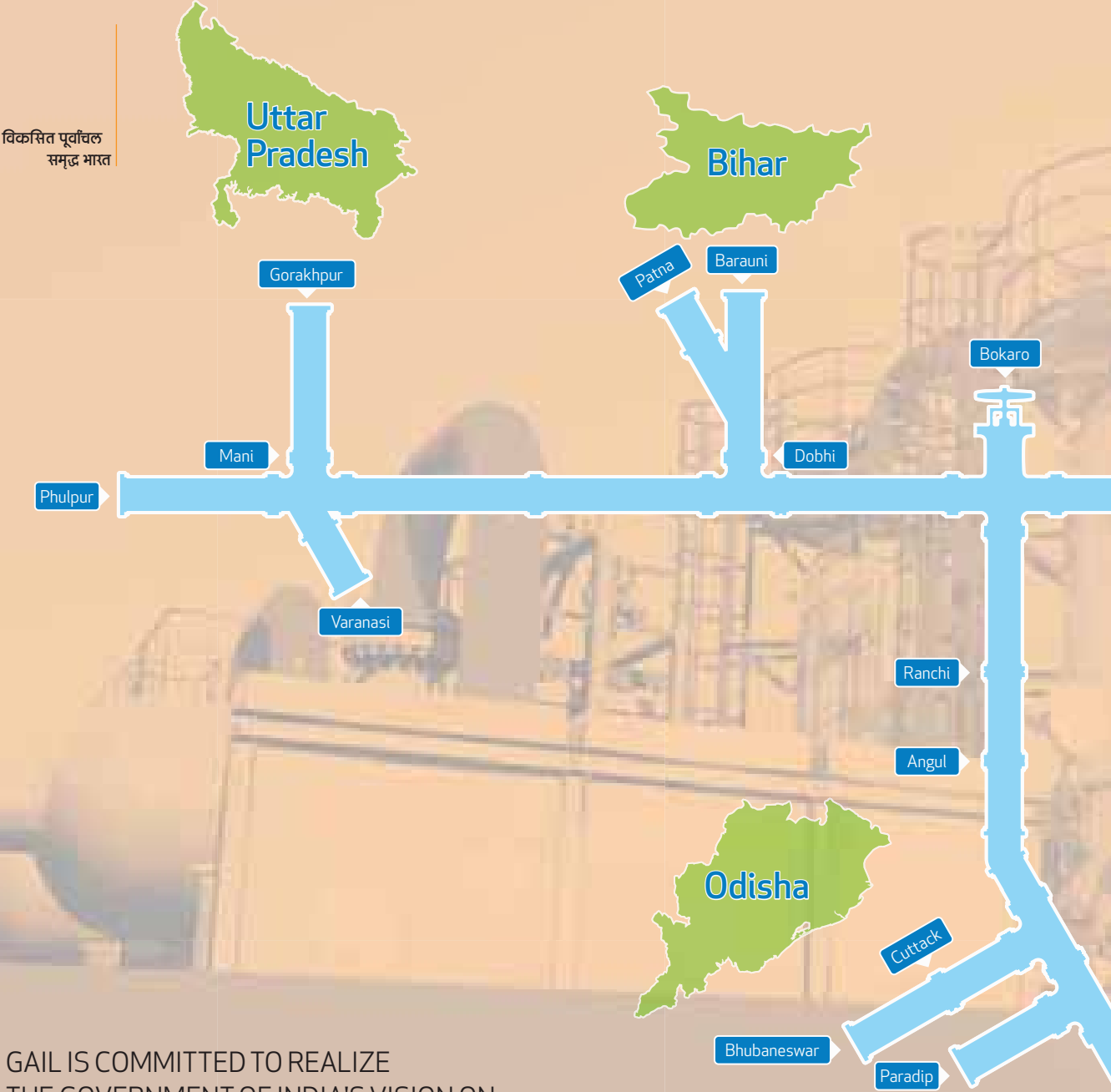
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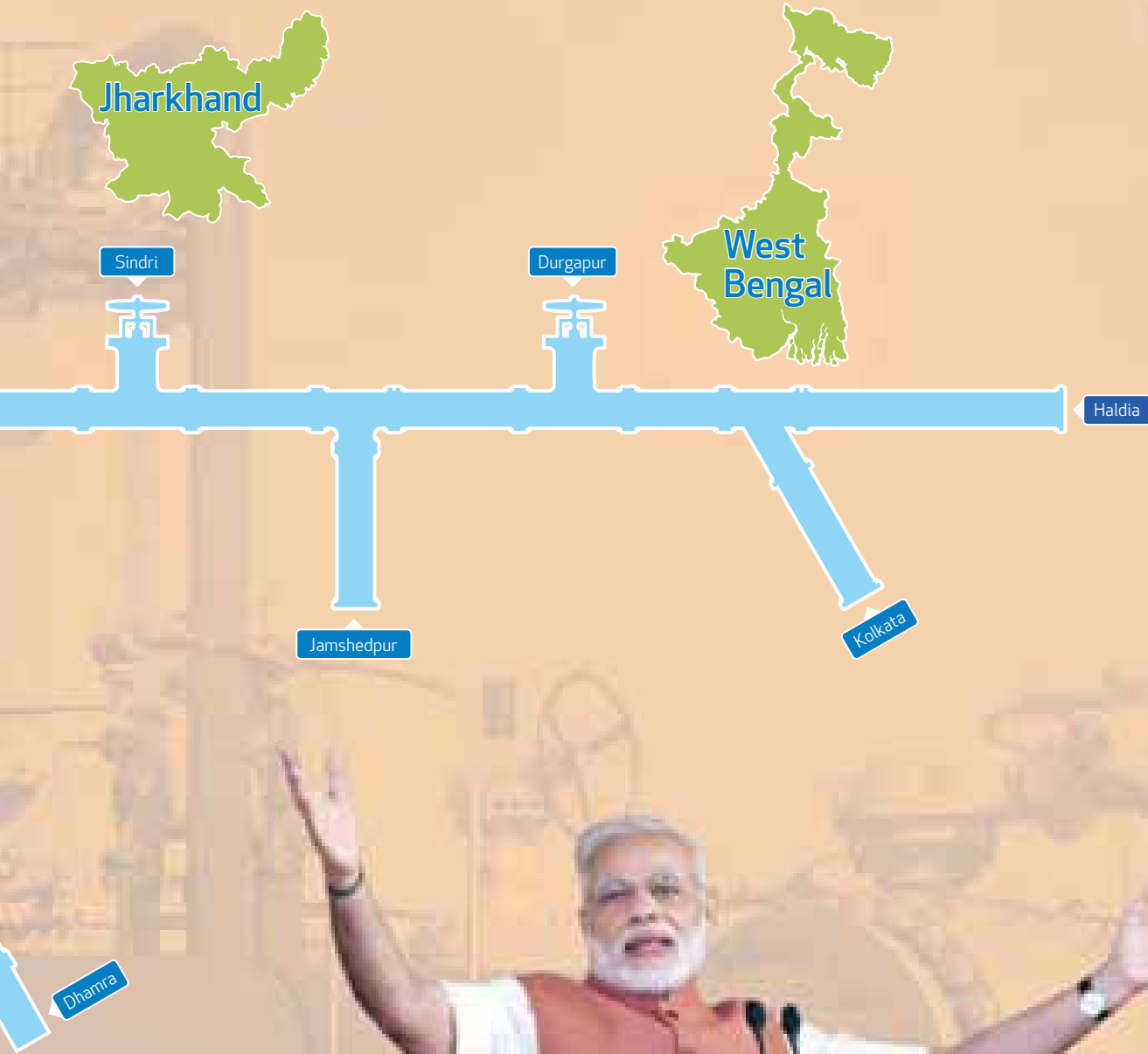
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