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Safety And Reliability In The Gas Industry: A Case Study Of Mahanagar Gas

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ABSTRACT :

This research paper explores the challenges and advancements in ensuring the safety and reliability of gas distribution, focusing on Mahanagar Gas Limited (MGL). The study incorporates real-world data and observations from an internship experience at MGL, addressing critical safety measures, industry challenges, and growth prospects. Recommendations are provided to enhance operational efficiency and safety standards in the gas industry.

Keywords: Mahanagar Gas, Gas Safety, Reliability, Operational Efficiency, Energy Industry

I. INTRODUCTION :

Natural gas is a clean and efficient fuel, playing an essential role in India's growing energy needs. However, its transport and distribution involve significant risks, including leaks, explosions, and environmental damage. This paper examines MGL's approach to addressing these challenges and its strategies for operational and safety enhancements.

II. BASICS OF THE PROJECT :

1. Background

MGL, a leading distributor of natural gas in Mumbai and adjoining areas, was established in 1995. It operates under the joint ownership of GAIL (India) Ltd. and BG Group. With a strong focus on safety, MGL serves over 1.53 million domestic users and hundreds of commercial and industrial clients.

2. Objectives

- To analyze the methods MGL employs to enhance safety and reliability.
- To identify challenges and provide actionable recommendations for improvement.

III. INDUSTRY ANALYSIS :

Natural gas accounts for 6.7% of India's energy mix, with a goal to increase this share to 15% by 2030. The gas industry is characterized by challenges such as land acquisition, regulatory approvals, and competition from alternative fuels.

Table 1. Major Players in the Indian Gas Industry

Company	Annual Turnover (₹ Crores)
Mahanagar Gas	18,065
GAIL	152,785
Adani Total Gas	92,109

IV. CHALLENGES FACED BY MGL :

1. Operational Challenges

- Land acquisition delays.
- Aging workforce and equipment reliability issues.

2. Market Challenges

- Increasing competition from LNG and electric vehicles.

- Reduced market exclusivity following regulatory changes.

V. TECHNICAL AND MANAGERIAL INSIGHTS :

1. Pipeline Safety

- Regular inspections and advanced leak detection technologies are essential.
- Root causes of pipeline damages include corrosion, natural disasters, and human error.

2. Managerial Skills

- Effective collaboration with various departments.
- Decision-making under uncertainty and risk management.

VI. DATA ANALYSIS :

Case Studies:

1. Dahisar Incident (2023)

A pipeline burst during excavation work caused significant disruption. The event emphasized the need for better monitoring and coordination with external contractors.

2. Kandivali Incident (2022)

Similar damages highlighted the importance of preventive maintenance and public awareness.

VII. RECOMMENDATIONS :

1. **Adopting Advanced Technologies:**
 - Use of fiber optics and smart pigging for real-time monitoring.
2. **Training and Development:**
 - Regular safety drills and workshops for employees.
3. **Policy and Compliance:**
 - Stricter enforcement of excavation protocols.
4. **Community Engagement:**
 - Enhancing public awareness about gas safety.

VIII. CONCLUSION :

Ensuring the safety and reliability of natural gas infrastructure is critical for sustainable energy delivery. MGL's ongoing efforts provide valuable insights for the industry. Implementing advanced monitoring systems, fostering a culture of safety, and engaging with stakeholders are pivotal steps forward.

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