



LPG Business Is The Maintenance Of Safety: The Bangladesh Context

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Liquefied Petroleum Gas (LPG) has emerged as a vital energy source for Bangladesh's domestic, industrial, and transport sectors. The LPG market in Bangladesh has experienced remarkable expansion over the past decade. As the nation transitions from a reliance on natural gas to a diversified energy mix, LPG offers a clean, efficient, and portable alternative. However, the very properties that make LPG convenient—its flammability, explosive nature, overpressure hazard, and wide use—also make it a significant safety concern. Fires and explosions have become increasingly frequent in Bangladesh in recent years. The LPG business, therefore, is fundamentally about maintaining safety throughout its lifecycle—from production, storage, and transportation to consumer use.

The Dual Nature of LPG: Energy and Hazard

LPG is a clean-burning fuel with a high heating value and lower carbon emissions compared to other hydrocarbons. It remains

in liquid form under moderate pressure (6–7 bar), which makes it highly portable and convenient for handling and storage. However, LPG also poses significant hazards. When released to the atmosphere, it vaporizes readily and can form explosive mixtures with air at very low concentrations (Lower Explosive Limit $\approx 2\%$). Its minimum ignition energy is extremely low (≈ 0.25 mJ), making accidental ignition easy.

To illustrate its energy potential, a typical 12 kg household LPG cylinder contains energy roughly equivalent to 128 kg of TNT, highlighting the catastrophic consequences of uncontrolled release, flash fire, or explosion. This dual nature—efficient fuel versus serious hazard—underscores the critical need for proper storage, handling, and safety precautions.

Unsafe Transportation and Storage: The Current Scenario in Bangladesh

Recent incidents across Bangladesh highlight the vulnerability of the LPG supply



chain. Explosions during refilling, cylinder leaks in households, and truck-loaded LPG cylinder accidents on highways underscore weaknesses in safety practices. Unsafe transportation—such as overfilled or poorly maintained tankers, lack of vehicle inspection, and untrained drivers—has led to several road accidents, fires, and explosions. Similarly, unsafe storage practices, including the use of expired or substandard cylinders and inadequate fire protection systems at depots, pose grave risks to workers and surrounding communities.

On March 13, 2024, a vapor cloud explosion occurred from a leaking gas cylinder in the Telirchala area of Kaliakair Upazila in Gazipur, leaving at least 35 people injured and, in the following days, claiming 16 lives as many of the burn victims succumbed to their injuries at the National Institute of Burn and Plastic Surgery. The incident began when a cooking gas cylinder leaked inside a home; the resident then threw it outside near the road. The gas leaked in a narrow, congested, busy road and formed a vapor cloud, which ignited and caused a sudden, large explosion.

On 19 July 2025, a disastrous explosion rocked the “CO Bazar LPG Auto Gas and Conversion Centre” in Rangpur city’s CO Bazar area, killing one person and injuring approximately 20 others. The deceased was an engineer working on repairs to a leaking LPG tanker. The explosion caused widespread physical damage: at least 20–30 vehicles—including ambulances, private cars, and motorcycles—parked in and around the station were severely damaged or destroyed; doors, windows, and structural elements of nearby residential and commercial buildings cracked or were torn off. The shock of the blast was heard and felt from well over a kilometer away.

Beyond casualties and damage, the

explosion sparked public concern over safety standards in LPG stations—particularly regarding prompt response to leaks, transparency in maintenance operations, and regulatory compliance. The blast served as a grim reminder of how deferred maintenance, unaddressed leaks, and insufficient safety oversight in storage and transportation systems can lead to major disasters. In many cases, the root cause lies in an inadequate safety management system, poor enforcement of standards, and a lack of safety culture among operators and consumers.

Hazard Management Across the LPG Life Cycle: Every stage of the LPG life cycle presents distinct hazards:

- **Storage:** Risk of leaks, vapor cloud explosions, or BLEVEs.
- **Handling and Refilling:** Faulty valves, improper hose connections, static discharge.
- **Transportation:** Mechanical failure, tanker rupture, collisions, leaks, or exposure to fire.
- **Consumer Use:** Leaks from regulators or hoses, confined space accumulation, or open flame ignition.

Addressing these requires both occupational safety (worker protection) and process safety (system integrity).

Managing Risk and Safety through Process Safety Management (PSM)

The implementation of OSHA Process Safety Management (PSM) standards is critically important for the LPG industry to prevent large-scale disasters and ensure sustainable operations. LPG, being highly flammable and stored under pressure, poses inherent risks of fire, explosion, and toxic release if not properly managed. PSM provides a systematic framework to identify, evaluate, and control process hazards throughout the entire life cycle—from storage and transfer to distribution and consumer use. By integrating key elements such as process hazard analysis (PHA), management of change (MOC), mechanical integrity, safe work practices, employee training, incident investigation, safety audits (internal and external), and emergency response planning, LPG industries can significantly reduce the likelihood of catastrophic incidents. Globally, most major industrial accidents—from Bhopal to Texas City—have been traced back to the absence or failure of effective process safety management. For Bangladesh’s rapidly growing LPG sector, adopting a robust PSM program is therefore not optional but imperative. It builds a culture of safety, ensures regulatory compliance, protects human lives and property, and enhances public trust in the industry’s commitment to responsible and safe energy delivery.

Regulatory Framework and Enforcement Challenges

Bangladesh has several laws and codes relevant to the LPG business, including the Explosives Act (1884), Petroleum Act (2016), Bangladesh Gas Act (2010), Explosive Rules (2004), LPG Rules (2004), and the Occupational Health and Safety Policy (2013). However, despite the existence of these legal frameworks, enforcement remains one of the most critical challenges in ensuring safety and compliance across the rapidly expanding LPG industry. To strengthen and ensure good governance, authorities should:





- Update and harmonize safety codes and standards with international standards.
- Introduce Process Safety Management (PSM) standards to manage risk in high-risk industries/installations, including LPG industries.
- Employ qualified inspectors and leverage third-party safety audits.
- Introduce structured training programs and certification mechanisms for enforcement officials to enhance their technical competence in LPG safety and risk assessment.
- Introduce compulsory training, certification, and periodic renewal for all personnel involved in LPG operations—plant operators, transport drivers, cylinder handlers, and technicians—to ensure they understand and adhere to safety standards.

The Role of Industry and Stakeholders

The safety of the LPG industry depends on shared responsibility:

- **Industry Operators:** Must allocate resources and establish internal safety management systems.
- **Regulators:** Should provide clear, enforceable standards and conduct regular inspections.
- **Consumers:** Need awareness on safe cylinder use, leak detection, and emergency actions.
- **Community and Media:** Play a vital role in awareness and accountability.

A cooperative and solution-oriented relationship between industry and

regulators is essential to foster a culture of prevention rather than reaction. However, in practice, safety compliance remains inadequate, monitoring mechanisms are weak, and enforcement is often ineffective. Regulatory bodies such as the Department of Explosives face significant limitations in manpower and technical capacity, making it difficult to inspect the vast number of LPG cylinders, storage facilities, and transport operations across the country. This gap between regulation and implementation continues to pose serious risks to public safety and undermines confidence in the overall governance of the LPG sector.

Safety Culture: A Moral and Economic Imperative

As Dr. Trevor Kletz, the father of inherent safety, wisely noted: “If you think safety is expensive, try an accident.” This statement captures the essence of why safety is not a cost but an investment—an investment in human lives, increasing productivity, organizational sustainability, and national resilience. Every Taka spent on prevention, whether on employee training, safety audits, quality equipment, or emergency preparedness, yields exponential returns by proactively avoiding near misses and mitigating the risk of catastrophic losses.

The economic rationale for safety is compelling. Industrial accidents result in massive direct and indirect costs: loss of life, property damage, legal liabilities, compensation claims, production downtime, and reputational damage that

can cripple even the largest corporations. Conversely, organizations that invest in proactive safety management systems enjoy higher operational reliability, improved workforce morale, and greater public trust. Safety thus becomes a competitive advantage in the marketplace.

In the LPG sector—where small lapses can lead to explosions, fires, and societal panic—ethical responsibility must align with financial prudence. A safe enterprise not only safeguards its employees but also protects the surrounding community and builds confidence in modern energy systems. In short, safety is not a cost center—it is a value creator. Every organization in the LPG supply chain must recognize that maintaining safety is both a moral obligation and an economic necessity for long-term success.

In Bangladesh’s growing LPG market, safety must remain at the core of business operations. From storage terminals to kitchens, every stakeholder has a role in preventing accidents. An effective safety management system not only protects lives and property but also ensures the sustainability of the LPG industry itself. The future of the LPG business in Bangladesh will be determined not by how much LPG we can distribute, but by how safely we can manage it. 

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