

Management Summary

Guide to Good Industry Practices for Bulk LPG Installations

GOOD INDUSTRY PRACTICES



The *WLPGA Guide to Good Industry Practices for Bulk LPG Installations* addresses the engineering, operation and safety requirements

The Guide is applicable for on bulk installations in terminals and depots, cylinder filling plants, customer installations and Autogas refuelling sites.

The guidelines in this document are adopted from globally recognised LPG standards and Codes of Practice as well as best practices from major LPG companies. The advice should be applied in conjunction with any applicable local or regional laws/regulations to enhance the overall safety performance of LPG businesses. The Guide does not cover refrigerated terminals, caverns, salt domes and mobile cylinder installations.

The location and layout for a LPG bulk installation should take into consideration the size of the storage tanks and nature of operations that will occur onsite.

Information contained in the Guide includes minimum separation distances—taken from NFPA58—the need for fire walls, site security measures and protection against possible damage from vehicles.

Tank failures due to poor construction can result in serious consequences. The Guides stresses the importance of designing and manufacturing pressurised tanks to a recognised code or standard to ensure their safety.

The design code and conditions are included, the need for corrosion protection and proper tanks supports, and the necessary tank markings and labelling. Mounded and underground tanks, as well as skid mounted and mobile tanks, are discussed.

There is a chapter focusing on tank fittings explaining the need for and purpose of pressure relief valves, liquid level indicators, filling connections, service outlets, drain connections, hydrostatic valves, emergency shut-down valves, pressure gauges, temperature gauges, lightning and vacuum protection.



The Guide stresses the need to minimise the number of direct connections below the liquid level to lower the risk of leakage of liquid LPG. Wherever possible, only one connection, excluding the drain line, should be provided and all the rest should terminate in the vapour space.

The *WLPGA Guide to Good Industry Practices for Bulk LPG Installations* also addresses the equipment required beyond the storage tank

Apart from the main storage tank, there are many other important components that impact on the safety of a bulk LPG storage installation and these too are included in the Guide.

The design of pumps, compressors, vapourisers and the material used in their construction should be suitable for the safe handling of LPG over the range of pressures and temperatures that the product will reach in service. Avoiding the possibility of brittle fractures.

Electric motors should be suitable for operating in potentially flammable atmospheres.

The different types, design and installation of pumps, compressors, vapourisers and dispensers are described.

All pipework and fittings should comply with the relevant standards and be suitable for use with LPG. And cope with the extreme service conditions that is likely to be encountered.

The Guide recommends keeping the number of joints in any system to a minimum and using welded fittings where possible. Flanges should always be located in such a way as to avoid flame impingement on associated equipment in the event of a leak. Eliminate cascade effects through good design.

Guidelines for burying steel pipework is covered with an emphasis on corrosion protection and the avoidance of damage. Advice on the installation of above ground pipework includes the need for proper support and protection against impact and over pressure.

The Guide also addresses the use of polyethylene pipework and connections and there benefits and limitations.

Logical markings or colour codes to communicate the contents and whether liquid or vapour phases are present. Often vapour lines are painted yellow and liquid lines painted blue for distinction.

Provision should be made to ensure that no electrostatic potential exists between the tanker delivery connection and the stationary tank fill connection which could generate a spark when the connection is made, or broken. The Guide includes advice on this important issue as well as a description of hazardous areas.



The *WLPGA Guide to Good Industry Practices for Bulk LPG Installations* also includes advice on fire protection, tank operations and training

The principles applied in this Guide to minimise the risk of a fire—including the escalation of a fire—focus on good design, layout and resourcing that comply with all relevant local legislation and codes of practice.

The importance of involving the fire services authority in the design and planning of bulk LPG installations as well as their participation in any subsequent fire drills.



The most effective form of fire protection is to avoid any release of LPG and if a release occurs to detect it immediately and shut it down. The Guide stresses the importance of using gas and fire detection and shutdown systems.

Once the bulk LPG installation has been installed, only fully competent, trained staff familiar with LPG tank commissioning and decommissioning should be assigned to carry out these procedures. The Guide explains the main procedures to be applied including testing pressures, purging and evacuation, and initially filling the tank with LPG. Decommissioning procedures are also included.

Once the tank is in service it will be subjected to frequent loading and unloading and the procedures and controls for these operations are critical. The Guide explains the need for trained personnel and lists a series of checks that must be applied to ensure safe operations including the correct positioning of road tankers and the importance of drive away protection. Various options for this are listed. Rail tanker loading and unloading is also included.

The need for training, written operating procedures, periodic inspection and routine maintenance, emergency procedures and good record keeping is emphasised.

The complete *Guide to Good Industry Practices for Bulk LPG Installations* and other WLPGA publications, can be found here: <https://www.wlpga.org/publications/wlpga-publications/>

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