



INSPECTIONS OF THE LPG ESTABLISHMENTS IN PORTUGAL

Graça Bravo
26th September 2017

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1. IDENTIFICATION OF THE LPG ESTABLISHMENTS

Number of Seveso establishments: 166

Upper tier: 58

Lower tier: 108

Number of Seveso LPG establishments: 34

LPG upper tier: 13

LPG lower tier: 21

Number of Seveso inspections in 2016: 102

Number of LPG Seveso inspections: 32

LPG upper tier: 11

LPG lower tier: 21

1. IDENTIFICATION OF THE LPG ESTABLISHMENTS

TYPE OF LPG ESTABLISHMENTS

Production – 2 refineries

Storage, bottling and distribution – 52

Marine terminal – 3

CAPACITY OF LPG ESTABLISHMENTS

Production – 128420 t/y

Storage in tanks and cylinders sites – the biggest site about 28000 t

Storage only in cylinders sites – the biggest site about 6800 t

2. GENERAL DESCRIPTION OF THE LPG ESTABLISHMENT

Hazard Identification of LPG

Extremely Flammable Gas.

Readily forms an explosive air-vapor mixture at ambient temperature.

Vapor is heavier than air and may travel to remote sources of ignition (e.g. along drainage systems, into basements, etc).

Liquid leaks generate large volumes of flammable vapor.

Storage in Pressure Vessels

LPG must be stored in systems of suitable pressure rating.

2. GENERAL DESCRIPTION OF THE LPG ESTABLISHMENT

1) Storage, Bottling and Distribution Site

Reception of LPG (pipeline, tank cars)

Storage Tanks

Control Room

Nitrogen Production (proper inert gas blanketing)

Gas Odor System (ethylmercaptane)

Flare

Waste Water Treatment Plant

Filling Up Islands

Bottling

Utilities

Expedition - LPG in tank cars / LPG in bottles

2) Storage in gas cylinder Site

2.GENERAL DESCRIPTION OF LPG ESTABLISHMENT

Site Safety Considerations

Separation Distances – storage tanks, buildings, utilities, etc, should be separated enough to reduce the probability of the domino effect.

Critical Equipment – the locations and distances between critical equipment should receive special attention.

Utilities – to maintain as well as possible during potential incidents and emergencies.

Control Room – this area is the last to be compromised in case of an accident.

Instrumentation and controls – the location of instrumentation and controls should allow the best possible access during emergencies.

Fire fighting equipment and emergency planning - Emergency drills, communications and fire fighting maintenance program.

3. INSPECTION SUPPORTING TOOLS

- Guidance Book for the Seveso inspections reviewed in 2016 because of the transposition of the Directive Seveso III, national law (D.L. nº150/2015, 5th August).
- General check list with the documents to check out during Seveso inspections.
- Documents produced by the Portuguese Competent Authority to support the operator to elaborate the safety report, the notification, the internal emergency plan, the information to the public, the major accident prevention policy.
- Common Inspection Criteria Bulletins edited by MAHB (Major Accident Hazards Bureau) from Technical Working Group 2-Seveso Inspections.
- National legislation and other standards or regulations.

4.LPG INSPECTIONS STRATEGY

In lower tier or upper tier establishments the inspector must always check:

- The implementation of the principles of Major Accident Prevention Policy and how is made the communication of the MAPP.
- The notification with the inventory of existing dangerous substances.
- All permits of the establishment should be available in one file only.
- The information to the public (up-to-date and made available to the public by the operator on a web link).

In lower tier establishments also the Simplified Internal Emergency Plan.

In upper tier establishments there is obligatory documents to check in the site:

- Safety Report, Safety Management System, Internal Emergency Plan.

4.LPG INSPECTIONS STRATEGY

The inspection strategy should include collecting all the information and evidences that justifies the operator's answer to the SEVESO requirements, followed by checks of certain key points during the inspection.

Organisation and Personnel

-Training plans should be related to the description of functions (employees and subcontractors) to minimise the human failure which could conduct to operational failure and to physical risks like overpressure, high temperatures, under ventilation or ignition sources.

4.LPG INSPECTIONS STRATEGY

Operational Control

- The compliance of the operational and maintenance procedures will ensure that critical operations are run in safety conditions such as work with ignition sources, entry into confined spaces, loading/unloading operations.
- Maintenance (preventive, corrective), calibration and inspection of the safety critical instrumentation and records for pressure safety valves and alarms (LAH, LAL, LAHH) in storage tanks and safety valves in pipelines.
- Maintenance and inspection of the pressure vessels and pressure pipelines in accordance with the national legislation or other internal requirements like specific standards or regulations.

4. LPG INSPECTIONS STRATEGY

- Maintenance, inspections and calibration of gas detectors located in the retention basin of the storage tanks, in the pumping stations, in the filling of tankers, in the bottling area, in the pipelines.
- Maintenance, inspections and calibration of fire detectors located in the storage tanks (up and down), in the pumping stations, in the filling of tankers, in the bottling area.
- Maintenance and inspection of the retention basin of the storage tanks in accordance with the operation manual.
- Work Permits to control and minimise the presence of ignition sources.
- Continuous control of the processual variables from the Control Room.
- Special attention should be paid to ground-fault protection of equipments.

4. LPG INSPECTIONS STRATEGY

- Relevant documentation for the safety of the facilities and processes such as process and instrumentation diagrams, block diagrams or simplified process diagrams, pipe and equipment specifications.
- Selection of the suppliers and service providers.

Audit and Review

- The performance of internal audits of the SMS.
- The performance of the annual external audits of the SMS defined in the national legislation by a certified auditor in order to guarantee the performance of the SMS.
- The planning of corrective and preventive measures to be implemented based on the results of the audits.

4.LPG INSPECTIONS STRATEGY

Emergency Planning

- Implementation of the instructions, information and training programme with the purpose of responding in case of emergency.
- Maintenance, inspection and testing of mobile resources and other equipment to be used in an emergency response, such as sprinklers in the storage tanks for cooling, sprinklers in the filling tankers, sprinklers in the bottling area and the ring of the fire water system, foam system, fire extinguishers, hydrants, monitors.
- Simulations to be done annually in accordance with legislation and implementation of its recommendations.
- Communication systems.
- Manual emergency shut-down of the equipment's.

5.INSPECTION REPORT

The SEVESO inspection reports are done in a database, internally available for consultation for all the staff. This report covers all aspects regarding de SMS.

The inspection report is sent to the operator with the facts verified during the inspection, recommendations and penalties.

Follow-Up actions

Focus on aspects considered as critical in the previous inspection.

6. INSPECTION FINDINGS

Establishments must improve their:

- Pro-active maintenance, improving their maintenance program collecting maintenance performance indicators.
- Risk analysis in the project phase.
- Modifications management.
- Records of incidents / accidents.
- Follow-up of incidents evaluation findings.
- Communication with the interested parts.

6. INSPECTION FINDINGS

Establishments must improve their:

- Equipment identification and equipment files.
- P&IDs complete and up-to-date.
- Implementation of the corrective measures that results from SMS audits.
- Evaluation of the age of the equipments.
- Safety training for the employees of the storage in gas cylinder sites.
- Implementation of the MAPP in the storage in gas cylinder sites.
- Risk analysis in the storage in gas cylinder sites.



Thank you.

Rua de “O Século”, nº51

1200-433 Lisboa

Telef: +351213 215 500

Email: igamaot@igamaot.gov.pt