

**Liquefied Petroleum Gas Facility
Written Fire Safety Analysis
For**

INDEX	Page
Introduction	2
Conducting the WFSA	2
WFSA CHECKLIST	
Section I Facility Information	3
Section II Facility Storage Container Information	4
Section III Container Product Control	5
Section IV Piping and Hose Systems	5
Section V Pumps and Compressors	6
Section VI Vaporizers	7
Section VII Accessing Plant Safety	7
Section VIII Operations and Maintenance	9
Section IX Employee Training	9
Section X Fire Service Information	10
Facility Operator Objectives	10
References	10
Comments	11
Facility Schematic	12

INTRODUCTION

The National Fire Protection Association's LP Gas Code (NFPA 58), 2020 edition, has been adopted by the Missouri Propane Safety Commission. Within NFPA 58, Section 6 requires that a Written Fire Safety Analysis (WFSA) be completed for all LP gas installations that use ASME containers with an aggregate capacity of more than 4,000 gallons (water capacity). Manifolder tanks meet this threshold if the aggregate volume exceeds 4,000 gallons.

The section also requires planning with local emergency agencies, such as fire and police departments, for the effective control of inadvertent product release or fire. This planning should consider the safety of emergency personnel, workers and the public.

The WFSA provides owners and operators of affected facilities with a self-audit tool that they can use to determine facility safety and enhance the effectiveness of local emergency responders. If serious hazards are identified during the assessment, special protection as allowed by NFPA 58 may be needed.

CONDUCTING THE WFSA

Your assessment must be prepared by a person approved by the Missouri Propane Safety Commission who has relevant experience and knowledge of industry practices. As a general rule, the Commission authorizes the owner or operator to prepare the WFSA. The exception is for an engineered facility, such as one that incorporates refrigerated storage, automated fuel standby (either industrial or utility) or pipeline terminals. These assessments must be prepared, stamped and signed by a professional engineer. Also, note that all storage tanks utilized by public utility companies as defined in RSMo 323 are regulated by the Missouri Public Service Commission.

There are five elements addressed in the WFSA:

1. Evaluation of the total product control system and its effectiveness;
2. Analysis of hazards within the facility, including congestion or other local conditions;
3. Assessment of exposure to and from other properties, populations and activities;
4. Determination of the probable effectiveness of local fire departments based on water supply, response time and training; and
5. Evaluation of the application of water by hose streams or other methods of effective control of leakage, fire or other exposures.

An authorized representative of your local fire department also must fill out Section X of the WFSA. This handbook will serve as a checklist for most Missouri LP gas facilities which fall under the WFSA requirement. In conducting your assessment, it might also be helpful to also consult NFPA's Pamphlets 58 and 54 along with the Missouri Propane Safety Commission "blue book" (2CSR 90) which contains applicable state laws and regulations.

WRITTEN FIRE SAFETY ANALYSIS CHECKLIST

SECTION 1 Facility Information					
1. Facility Name:					
2. Physical Address:					
3. County:					
4. Mailing Address:					
5. City:			Zip Code:		
6. Latitude:			Longitude:		
7. Daytime Telephone:					
8. Emergency Telephone:					
9. Facility Fax Number:					
10. Email:					
11. Facility Owner/Manager					
12. Type of Facility:		Commercial	Industrial	Bulk plant	Other
13. Propane is received by (check all that apply):		Transport	Bulk truck	Pipeline	Rail tanker
14. Propane is distributed from facility by (check all that apply):					
Vapor pipeline		Liquid pipeline		Transport	Bulk truck
Rail tanker		Cylinders by truck		Other _____	
15. Number of vehicle gates in/out of facility:					
16. Number of pedestrian gates in/out of facility:					
17. Is the facility normally staffed?					
18. If so, what are the normal hours?					
19. Facility Environment:		Rural	Suburban	City/Commercial Industrial	City/Suburban residential
20. Type of roads to Facility:		Private drive	County road	State highway	Interstate highway
21. Road Construction:		Asphalt	Concrete	Gravel	Dirt

SECTION II Facility Storage Container Information				
1. Number of Storage Tanks:				
2. Capacity in Water Gallons:				
Tank 1	Tank 2	Tank 3	Tank 4	
Tank 5	Tank 6	Tank 7	Tank 8	
3. Working Pressure:				
Tank 1	Tank 2	Tank 3	Tank 4	
Tank 5	Tank 6	Tank 7	Tank 8	

4. Do all tanks have attached/legible data plates?			
Tank 1	Tank 2	Tank 3	Tank 4
Tank 5	Tank 6	Tank 7	Tank 8
5. Tank serial number			
Tank 1	Tank 2	Tank 3	Tank 4
Tank 5	Tank 6	Tank 7	Tank 8
6. Tank manufacturer			
Tank 1	Tank 2	Tank 3	Tank 4
Tank 5	Tank 6	Tank 7	Tank 8
7. Date of manufacture			
Tank 1	Tank 2	Tank 3	Tank 4
Tank 5	Tank 6	Tank 7	Tank 8
8. Date(s) installed			
Tank 1	Tank 2	Tank 3	Tank 4
Tank 5	Tank 6	Tank 7	Tank 8
9. Are tanks ASME constructed?		Yes	No
10. Are tanks manufactured for LP use?		Yes	No
11. Are container shells in good condition?		Yes	No
12. Is corrosion present on shell?		Yes	No
13. Are containers properly painted?		Yes	No
14. Are product ID placards displayed?		Yes	No
15. Are tanks located in flood plain?		Yes	No
If yes, are tanks properly anchored?		Yes	No
16. Are tanks level?		Yes	No
17. If facility has more than one tank, are the tanks connected?		Yes	No
If yes, are tank tops level with each other?		Yes	No
18. Do containers conform to setbacks?		Yes	No
19. Container support and conditions (footings/foundations?)			
Concrete	Acceptable	Unacceptable	
Concrete/steel	Acceptable	Unacceptable	
Steel skid	Acceptable	Unacceptable	
Tank insulated at support	Acceptable	Unacceptable	

SECTION III Container Product Control		
1. Liquid gauging device	Yes	No
2. Pressure gauge	Yes	No
3. Required shut-off valves	Yes	No
4. Required excess flow valves	Yes	No
5. Required back-check valves	Yes	No
6. Relief valves		
Adequate capacity	Yes	No
Proper sized vent stacks	Yes	No
Rain caps installed?	Yes	No

SECTION IV Piping and Hose Systems		
1. Is piping safe and suitable for LP service, including design pressure, approved by manufacturer for such service and acceptable to the authority having jurisdiction?	Yes	No
2. Is each section that can be isolated by valves equipped with a hydrostatic relief valve?	Yes	No
3. Do piping materials conform to NFPA specifications?	Yes	No
4. Do pipe fittings conform to NFPA specifications including designed working pressure?	Yes	No
5. Do all valves, other than container valves, also meet NFPA specifications; are they suitable for the system application including working pressure?	Yes	No
6. Does the system contain a sufficient number, size and placement of excess flow valves and/or back-check valves to adequately protect the system?	Yes	No
7. Is the loading/unloading portion of the piping system adequately protected by properly sized and adequately placed bulkheads or other protection?	Yes	No
8. Are emergency shutoff valves installed in the appropriate vapor and liquid locations?	Yes	No
9. Is all above-ground piping properly supported and adequately protected from physical damage?	Yes	No
10. Is underground piping buried at a proper depth, protected with backfill and provided with adequate corrosion protection?	Yes	No

11. Are there provisions within the piping system to compensate for expansion, contraction, jarring and vibration?	Yes	No
12. Do all flexible piping components comply?	Yes	No
13. Are all hoses manufactured for LP use?	Yes	No
14. Do all hoses have a design working pressure of 350 PSI?	Yes	No
15. Are all hoses manufactured with a safety factor of 5:1?	Yes	No
16. Are hoses continuously marked "LP Gas," "Propane," "350 PSI"?	Yes	No
17. Is the manufacturer's name or trademark on the hose?	Yes	No
18. Do hose assemblies have a design capability of at least 700 PSI?	Yes	No
19. Do hoses and flexible connectors comply with NFPA?	Yes	No
20. Are hydrostatic relief valves installed in sections of hose that can be isolated by valves?	Yes	No

SECTION V Pumps and Compressors		
1. Are pumps designed for LP gas use and installed according to manufacturer's specifications?	Yes	No
2. Are compressors designed for LP gas use and installed according to manufacturer's specifications?	Yes	No
3. Are there means to limit suction pressure to within the design limits of the compressor?	Yes	No
4. Are there means to prevent the entrance of liquid LP into the compressor suction?	Yes	No

SECTION VI Vaporizers			
1. Type of vaporizer	Direct fired	Indirect fired	Gas
	Electric	Other _____	
2. Vaporizer manufacturer			
3. Vaporizer capacity			
4. Date of installation			

5. Is vaporizer installed according to manufacturer's specifications?	Yes	No
6. Does vaporizer have a design working pressure of 250 PSI?	Yes	No
7. Do vaporizer markings comply with NFPA 58?	Yes	No

SECTION VII Assessing Plant Safety			
1. Is the facility protected by a 6-foot industrial-type fence with an appropriate number of gates?	Yes	No	
2. Are the gates locked while the facility is unattended?	Yes	No	
3. Does the storage area have a properly sized, fully charged and strategically placed fire extinguisher?	Yes	No	
4. Have plans been submitted and approved as required by the Missouri Propane Gas Commission (or previously, Department of Weights and Measures)?	Yes	No	
5. Date the plans were submitted	Date plans approved		
6. Are warning signs and placards posted as required?	Yes	No	
7. Are emergency telephone numbers posted in conspicuous locations?	Yes	No	
8. Does the product transfer location and operation comply with NFPA 58?	Yes	No	
9. Do all electrical wiring and components meet National Electric Code and NPGA requirements?	Yes	No	
10. Location of electric poles from storage (feet)			
11. Are electrical lines a minimum of six feet horizontal from LP gas containers?	Yes	No	
12. Are pumps equipped with an operating control or disconnect nearby?	Yes	No	
13. Are emergency shut-off valves equipped with remote cables or activating devices?	Yes	No	
14. If there is refined fuel storage on the property, is it located at a lower grade than the LP gas container?	Yes	No	
15. Are containers located at least 20 feet from aboveground tanks storing other Class I, II or III liquids?	Yes	No	Not applicable

16. All sources of ignition being removed or turned off while transfer operations, connections or disconnections are made or when LP is being vented?		
	Yes	No
17. Does the system comply with NFPA regarding other ignition sources?		
	Yes	No
18. Are hoses, valves, piping and fittings maintained in good condition and free from leaks?		
	Yes	No
19. Exposures to facility	Other fuel Storage Traffic/vehicles	Electrical lines/transformers/substations Other _____
20. Exposures from facility		
	Industrial facilities	Commercial facilities
	Schools	Other public/institutional buildings
	Farm fields/crops	Anhydrous/Ammonia
		Manufacturing Other fuel storage
21. Are storage containers protected from vehicular damage?		
	Yes	No
22. Is adequate nighttime lighting provided if the facility normally operates other than daylight hours?		
	Yes	No
23. Are combustible materials, weeds and tall grass kept at least 10 feet away from the storage area?		
	Yes	No

SECTION VIII Operations and Maintenance		
1. Are persons who operate LP gas bulk plant or industrial systems using written procedures for conducting activities associated with the job duties?		
	Yes	No
2. Does the facility owner or operator ensure that the operating procedures are updated as necessary when major changes occur and prior to starting up an altered system?		
	Yes	No
3. Has the owner or operator prepared and implemented procedures to maintain the mechanical integrity of the LP gas system?		
	Yes	No
4. Are all persons who perform maintenance of the LP gas system trained in the hazards of the system and in the maintenance and testing procedures applicable to the installation?		
	Yes	No
5. If there are maintenance contractors, do they ensure that their employees are trained and supervised in performing these procedures?		
	Yes	No

SECTION IX Employee Training		
1. Are all persons who transport and handle LP gases properly trained?	Yes	No
2. Are all persons who install, repair or service LP gas equipment trained?	Yes	No
3. Type and interval of training employees are required to attend CETP or equivalent every three years HazMat refresher every three years Other _____		
4. Are employees trained in bulk plant emergency procedures?	Yes	No

SECTION X Fire Service information	(To be completed by the fire service)	
1. Name of Fire Department		
2. Location of nearest fire station		
3. Telephone number		
4. Is the facility accessible for fire-fighting/emergency response?	Yes	No
5. Location/distance of nearest fire hydrant/water supply		
6. Is water supply adequate to protect storage facility in case of fire?	Yes	No
7. Type of water supply	Municipal	Private Well Other _____
8. Is foam/equipment available?	Yes	No
9. Do fire service personnel have adequate training to respond to LP incidents?	Yes	No
10. Does the fire department have after-hours access to this facility?	Yes	No
11. Are fire personnel familiar with the facility?	Yes	No
12. Name other fire services that could provide mutual aid of required and distance:		
Name	Distance	
Name	Distance	
Name	Distance	
13. Type of fire equipment/capabilities available from other fire services		

Facility Operator Objectives
1. Be a good neighbor!
2. Give a plant tour to all local fire departments and emergency response personnel. Explain plant and equipment operation.
3. Properly maintain and inventory all equipment.
4. Protect plant from tampering, theft and vandalism.
5. Respond to neighbor complaints and concerns in a timely fashion.

6. Prominently display emergency contact numbers and ensure they are answered.

7. Never discharge more product than is necessary into the atmosphere; always away from potential ignition sources and upwind of neighbors.

8. Inform department of University of Missouri "Propane Emergencies" classes.

References

National Fire Protection Assn. Liquefied Petroleum Gas Code (NFPA 58) National Fire Protection Assn. National Fuels Gas Code (NFPA 54) Revised Statutes of the State of Missouri, Chapter 323, Liquefied Petroleum Gases Code of State Regulations, Title 2, Division 90, Chapter 10, LP Gases

SECTION XIV Comments

List any comments concerning this facility

SECTION XV Facility Schematic

