PACKAGED CHLORINE CUSTOMER SAFETY AND SECURITY CHECKLIST

Edition 4
October 2017

TABLE OF CONTENTS

1. INTRODUCTION

1.1 PURPOSE AND USE

The Chlorine Institute Member Safety and Security Commitment (MSSC) requires chlorine suppliers to assure that each chlorine customer has an effective risk management program in place for the proper handling of chlorine.

This checklist (Appendix A) has been prepared to help chlorine suppliers evaluate the capability of North American customers of packaged chlorine (one ton container or smaller) to safely unload and handle chlorine at the facility where the chlorine is used. The checklist is intended only to provide limited information to assist both the supplier of chlorine and its customer. The checklist emphasizes key chlorine-specific recommendations as developed by the Chlorine Institute. The checklist is intended to supplement Institute publications, not replace them. It is not meant to incorporate regulatory or other requirements that may be applicable at the facility. In the United States, facilities using or otherwise handling chlorine may be affected by OSHA's Process Safety Management (PSM) Rule for Highly Hazardous Chemicals, 29 CFR 1910.119, and/or the EPA's Accidental Release Prevention Requirement: Risk Management Programs (RMP), 40 CFR Part 68. Canadian and Mexican facilities may have similar or other regulatory requirements.

This checklist should be completed by either a representative(s) of the chlorine customer facility or by a representative(s) of the chlorine supplier. Both the customer and the supplier should agree in advance who will complete the checklist and how it will be used. The completed checklist should be kept confidential between the parties unless it is mutually agreed to release it to other parties. The chlorine supplier and customer should have a record retention policy for this checklist and should advise the other party what the policy is. The Institute recommends the checklist be completed and used as follows:

(1) Complete General Customer Information as indicated in Section 3.

(2) For Sections 3-11, answer each question with a “Yes,” “No,” or “Not applicable (N/A)” and/or provide a written comment.

- An “N/A” response is indicated when the item is not applicable to the facility.

- It is not intended that each item in the completed checklist will have a written comment. Typically, a “Yes” or “N/A” response will not require a comment. Comments should be included when necessary to clarify a response. Such clarification may be helpful to a subsequent reviewer if the response is negative. Some companies may prefer to provide a written comment as a response to a question rather than providing a “Yes” or “No” response. That is perfectly acceptable. Comments should be fact-based.

(3) Each item includes a reference where the item is discussed in more detail in specific Chlorine Institute publications. Section 2 provides a complete listing of such references. It is recommended that the pamphlets referenced be consulted

when completing the checklist to ensure the item is fully understood. Pamphlets can be found on the Chlorine Institute website.
To obtain a copy of the *Site Security Guidance for Chlorine Facilities* or a copy of the *Security Management Plan for the Transportation and On-Site Storage and Use of Chlorine Cylinders, Ton Containers and Cargo Tanks* as a CI member please contact CI directly. If you are a nonmember that has been requested to complete this checklist please request the site security guidance and security plan through your supplier.

(4) Upon completion of the checklist, the chlorine supplier and customer should discuss it and agree to any needed actions that would enhance the capability of the chlorine customer to safely unload and handle chlorine at the involved facility.

(5) The customer should have a process in place to ensure deficiencies are corrected in a timely manner.

1.2 CHLORINE INSTITUTE STEWARDSHIP PROGRAM

The Chlorine Institute exists to support the chlor-alkali industry in advancing safe, secure, environmentally compatible, and sustainable production, distribution, and use of its mission chemicals[1].

Chlorine Institute members are committed to adopting the CI's safety and stewardship initiatives, including pamphlets, checklists, and incident sharing, that will assist members in achieving measurable improvement. For more information on the Institute's stewardship program, visit the Chlorine Institute's website at www.chlorineinstitute.org.

1.3 DEFINITIONS AND ABBREVIATIONS

In this checklist, the following meanings apply unless otherwise noted:

CFATS	Chemical Facility Anti-terrorism Standard
CFR	Code of Federal Regulations
chlorine	dry chlorine, either gas or liquid
CI	The Chlorine Institute
DOT	U.S. Department of Transportation
EPA	Environmental Protection Agency
LEPC	Local Emergency Planning Committee
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment

[1] CI's mission chemicals: chlorine, sodium and potassium hydroxides, sodium hypochlorite, the distribution of vinyl chloride monomer (VCM), and the distribution and use of hydrogen chloride.

PSM	Process Safety Management
RMP	Risk Management Program
Scrubbers	Device for removal of chlorine from a stream via reaction, adsorption or absorption.
SDS	Safety Data Sheet

1.4 APPROVAL

The Institute's Product Stewardship Issue Team approved Edition 4 of this checklist on October 31, 2017.

1.5 REVISIONS

Suggestions for revisions should be directed to the Secretary of the Institute.

1.6 SIGNIFICANT REVISIONS IN CURRENT EDITION

This edition includes numerous enhancements that were designed to simplify the checklist, improve consistency between the bulk, packaged, and distributor customer checklists, and provide for greater flexibility in use. This involved reformatting, eliminating, regrouping and restating a number of questions. The checklist is now in Appendix A.

2. REFERENCES

2.1 CHLORINE INSTITUTE PAMPHLETS

These pamphlets refer to issues raised in this checklist. CI's pamphlets are frequently updated. Please visit CI's website to view the most up-to-date edition currently available for each pamphlet at www.chlorineinstitute.org.

Pamphlet & DVD #	**Title**
1	*Chlorine Basics,* Pamphlet 1, ed. 8; The Chlorine Institute: Arlington, VA 22209, **2014**.
6	*Piping Systems for Dry Chlorine*, Pamphlet 6, ed. 16; The Chlorine Institute: Arlington, VA, **2013**.
9	*Chlorine Vaporizing Systems*, ed. 8; Pamphlet 9; The Chlorine Institute: Arlington, VA, **2017**.
17	*Packaging Plant Safety and Operational Guideline,* ed. 5, Pamphlet 17; The Chlorine Institute: Arlington, VA, **2017**.
49	*Recommended Practices for Handling Chlorine Bulk Highway Transports*, ed. 10, Pamphlet 49; The Chlorine Institute: Arlington, VA, **2016**.

Pamphlet & DVD #	**Title**
63	*First Aid, Medical Management/Surveillance and Occupational Hygiene Monitoring Practices for Chlorine*, ed. 9, Pamphlet 63; The Chlorine Institute: Arlington, VA, **2017**.
64	*Emergency Response Plans for Chlor-Alkali, Sodium Hypochlorite, and Hydrogen Chloride Facilities,* ed. 7, Pamphlet 64; The Chlorine Institute: Arlington, VA, **2014**.
65	*Personal Protective Equipment for Chlor-Alkali Chemicals,* ed. 6, Pamphlet 65; The Chlorine Institute: Arlington, VA, **2015**.
66	*Recommended Practices For Handling Chlorine Tank Cars,* ed. 5, Pamphlet 66; The Chlorine Institute: Arlington, VA **2015***.*
73	*Atmospheric Monitoring Equipment for Chlorine,* ed. 8, Pamphlet 73; The Chlorine Institute: Arlington, VA, **2016**.
76	*Guidelines for the Safe Motor Vehicular Transportation of Chlorine Cylinders and Ton Containers,* ed. 5, Pamphlet 76; The Chlorine Institute: Arlington, VA, **2012**.
89	*Chlorine Scrubbing Systems,* ed. 4, Pamphlet 89; The Chlorine Institute: Arlington, VA, **2016**.
95	*Gaskets for Chlorine Service,* ed. 5-R2, Pamphlet 95; The Chlorine Institute: Arlington, VA, **2017**.
152	*Safe Handling of Chlorine Containing Nitrogen Trichloride,* ed. 3, Pamphlet 152; The Chlorine Institute: Arlington, VA, **2011**.
155	*Water and Wastewater Operators Chlorine Handbook*, ed. 3, Pamphlet 155; The Chlorine Institute: Arlington, VA, **2014**.
165	*Instrumentation for Chlorine Service,* ed. 3, Pamphlet 165; The Chlorine Institute: Arlington, VA, **2017**.
IB/A	*Instruction Booklet: Chlorine Institute Emergency Kit "A" for 100-lb. and 150-lb. Chlorine Cylinders,* ed. 12-R2, IB/A; The Chlorine Institute: Arlington, VA, **2014**.
IB/B	*Instruction Booklet: Chlorine Institute Emergency Kit "B" for Chlorine Ton Containers,* ed. 11-R1, IB/B; The Chlorine Institute: Arlington, VA, **2014**.
IB/RV	*Instruction Booklet: Chlorine Institute Recovery Vessel for 100 lb. and 150 lb. Chlorine Cylinders,* ed. 2, IB/RV; The Chlorine Institute; Arlington, VA, **2009**.

2.2 OTHER CHLORINE INSTITUTE REFERENCES

Site Security Guidance for Chlorine Facilities; The Chlorine Institute: Arlington, VA, **2002.**

Security Management Plan for the Transportation and On-Site Storage and Use of Chlorine Cylinders, Ton Containers and Cargo Tanks; The Chlorine Institute: Arlington, VA, **2003.**

APPENDIX A
Packaged Chlorine Customer Safety and Security Checklist

3. GENERAL CUSTOMER INFORMATION					
Company Name:					
Facility Address:					
Contact Name:					
Email:			Phone:		
Checklist completed by (name):	Title:		Date:		
Checklist Items	***Applicable CI Pamphlets & References***	***Yes***	***No***	***N/A***	***Comments***
3.1 Is the company a member of the Chlorine Institute?	**CI Member Safety & Security Commitment**				
3.2 Is the facility subject to the requirements of the U.S. OSHA Process Safety Management (PSM) rule, 29 CFR 1910.119 and/or of the U.S. EPA Risk Management Program (RMP) regulations, 40 CFR Part 68, and SARA Title III Section 313 release reporting?	**CI Pamphlet 155,** Appendix C: Process Safety Management **CI Pamphlet 155,** Appendix D: Risk Management Program **CI Pamphlet 64**				
3.3 What is the maximum number of chlorine cylinders or ton containers that are stored at this site?					
3.4 Does the facility/company transport chlorine containers? If yes, there are additional DOT requirements for the company, truck drivers and transportation equipment.	**CI Pamphlet 76** 49 CFR 172.800 (DOT Transportation Security) CI Security Management Plan for the Transportation and On-Site Storage and Use of Chlorine Cylinders, Ton Containers and Cargo Tanks				
4. SECURITY					
4.1 Is your plant covered by the Chemical Facility Anti-terrorism Standard (CFATS)?	CI Site Security Guidance for Chlorine Facilities				
4.2 Has the facility conducted a security vulnerability assessment?	CI Site Security Guidance for Chlorine Facilities				
4.3 Has the facility developed a security plan addressing issues such as access control, securing product storage areas, security monitoring, etc.?	CI Security Management Plan for the Transportation and On-Site Storage and Use of Chlorine Cylinders, Ton Containers and Cargo Tanks				

4.4 Have employees had security awareness training?					
5. PERSONNEL SAFETY & TRAINING					
5.1 Does the facility have a chlorine-specific training program on safe use and handling of chlorine and document training for employees, new hires and contractors?	**CI Pamphlet 1,** Section 6: Employee Training & Safety **CI Pamphlet 65,** Section 11: Training in the use of personal protective equipment **CI Pamphlet 155,** Section 9: Employee Training				
5.2 Is a current SDS available for chlorine and are warning signs, wall charts and/or other safety information used and visible?	**CI Pamphlet 1,** Section 6: Employee Training & Safety				
5.3 Does the facility policy on Personal Protective Equipment (PPE) comply with CI recommendations for handling chemicals?	**CI Pamphlet 1,** Section 6: Employee Training & Safety **CI Pamphlet 65**				
5.4 Does the facility policy for respiratory protection comply with CI recommendations for chlorine handling and emergency response?	**CI Pamphlet 1,** Section 6: Employee Training & Safety **CI Pamphlet 63** **CI Pamphlet 65**				
5.5 Are accidents and incidents investigated and reviewed with operating personnel?					
6. EMERGENCY RESPONSE					
6.1 Does the facility have a documented, up-to-date Emergency Response Plan that includes chlorine?	**CI Pamphlet 1,** Section 5: Emergency Measures **CI Pamphlet 64,** Section 2: Organizational planning				
6.2 Does the Response Plan appropriately address communication with outside agencies, the media, and the neighboring public?	**CI Pamphlet 64,** Section 4: Planning for coordination with outside agencies				
6.3 Has the facility discussed its emergency response plans with the local fire department and the local emergency planning committee (LEPC)?	**CI Pamphlet 64,** Section 4: Planning for coordination with outside agencies				
6.4 Would you require off-site assistance to respond to a release of chlorine?					
6.5 If you require off-site assistance, have you verified that the off-site service have trained personnel to mitigate a chlorine release?					
6.6 Do facility employees respond to and mitigate on-site or off-site chlorine leaks?					
6.7 Have emergency responders received training in accordance with local, state or provincial, and national requirements?	**CI Pamphlet 64,** Section 3: Planning for handling the emergency				

6.8 Are periodic drills performed?	**CI Pamphlet 64,** Section 3: Planning for handling the emergency				
6.9 Does the facility have access to basic emergency response equipment, e.g. * A or B Kit * Recovery vessel * Self-contained breathing apparatus?	**CI Pamphlet 1,** Section 5: Emergency Measures **CI Pamphlet 155,** Section 10: Handling Emergencies **CI Pamphlet 49,** Section 3: Emergency Response **CI Pamphlet 66,** Section 3: Emergency Response **CI Instruction Booklets IB/A, IB/B & IB/RV**				
6.10 Is emergency response equipment inspected regularly and maintained in suitable condition?	**CI Pamphlet 65,** Section 10: Maintenance of Personal Protective Equipment **CI Instruction Booklets IB/A, IB/B & IB/RV**				
6.11 Are wind socks or other means of determining wind direction appropriately located and easily visible from all areas of the facility?	**CI Pamphlet 1,** Section 5: Emergency Measures **CI Pamphlet 64,** Section 3: Planning for handling the emergency				
7. PROCESS PIPING (LIQUID & GASEOUS SERVICE)					
7.1 Do piping, hoses and all components used for chlorine service comply with recommendations of CI, such as metallurgy, schedule (pipe thickness), welding requirements, etc?	**CI Pamphlet 6** **CI Pamphlet 95**				
7.2 Are components routinely inspected and tested or replaced on a preventive maintenance basis?	**CI Pamphlet 6,** Section 12: Routine and Periodic Inspection and Maintenance				
7.3 Is the piping and component system well-marked, clearly visible and protected from damage?	**CI Pamphlet 6,** Section 10: Piping Layout Design Considerations				
8. VAPORIZING SYSTEM ***If a vaporizing system is in use, answer the questions in Section 8. Otherwise, skip to Section 9.***					
8.1 Is the vaporizer heating medium non-organic based, limited to less than 250°F (121°C) and at a lower pressure than the chlorine supply pressure?	**CI Pamphlet 9,** Section 3: Design				
8.2 Is the vaporizer designed with a low temperature alarm/shutdown at -40°F (-40°C)?	**CI Pamphlet 9,** Section 3: Design				
8.3 Is the vaporizer outlet equipped with a pressure relief valve?	**CI Pamphlet 9,** Section 4: Controls and Indicators				

8.4 Does the facility have a scheduled and routine inspection program for the vaporizer, including steps to monitor nitrogen trichloride levels in areas where it can accumulate?	**CI Pamphlet 9,** Section 5: Safety & Section 8: Maintenance **CI Pamphlet 152,** Section 5: Control and monitoring of NCL3 and NCL3 sources; Section 7: Limiting Levels of NCL3 & Section 8: Design/Operating Concerns & Considerations				
8.5 Is there adequate backflow protection for the vaporizer?	**CI Pamphlet 9,** Section 5: Safety				
9. SCRUBBING EQUIPMENT ***If the facility utilizes a scrubber, answer the questions in Section 9. Otherwise, skip to Section 10. A scrubber is defined as a device for removal of chlorine from a stream via reaction, adsorption or absorption.***					
9.1 Is the scrubber capacity designed to process the facility's most probable release scenario?	**CI Pamphlet 89,** Section 3: Process Considerations				
9.2 Does the scrubber have passive capability or is it equipped with emergency stand-by power?	**CI Pamphlet 89,** Section 4: System Design				
10. STORAGE AND USE AREAS					
10.1 Are cylinders and ton containers segregated and properly secured as defined by the applicable fire and building codes and stored away from any heat source?	**CI Pamphlet 155** **CI Pamphlet 1,** Section 3: Cylinders and Ton Containers				
10.2 Are full ton containers stored so that each end is accessible in case a Kit B is needed?	**CI Pamphlet 155**				
10.3 Does the facility have chlorine monitoring and leak detection equipment in the cylinder and ton container storage and use areas?	**CI Pamphlet 64,** Section 3: Planning for handling the emergency **CI Pamphlet 73** **CI Pamphlet 165**				
10.4 Is monitoring equipment interfaced into an alarm system with appropriate detection set points and routinely inspected and calibrated?	**CI Pamphlet 64,** Section 3: Planning for handling the emergency **CI Pamphlet 73** **CI Pamphlet 165**				
10.5 Is the storage area free from debris and flammable materials?	**CI Pamphlet 1,** Section 3: Cylinders and Ton Containers **CI Pamphlet 155**				
10.6 Are appropriate lifting devices being utilized to move ton containers?	**CI Pamphlet 1,** Section 3: Cylinders and Ton Containers **CI Pamphlet 76,** Section 3.2: Ton Container Loading and Unloading **CI Pamphlet 155**				

10.7 Are written operating procedures available and being utilized by employees that address the appropriate steps for hooking up and disconnecting cylinder and ton containers?	**CI Pamphlet 155**				
10.8 Does the facility have an inventory management accountability system for tracking chlorine containers?	**CI Pamphlet 17,** Appendix C				
10.9 Does the chlorine room have adequate ventilation and has the discharge location been evaluated and identified as a potential hazard?	**CI Pamphlet 155,** Section 7: Ventilation and Air Openings				
11. SAFETY SHOWERS/EYEWASH STATIONS					
11.1 Are safety showers and eyewash stations adequately located and easily accessible from all areas?	**CI Pamphlet 1,** Section 6: Employee Training & Safety				
11.2 Are the safety showers and eyewash stations periodically inspected for proper operation?	**CI Pamphlet 1,** Section 6: Employee Training & Safety				
11.3 Is there a system for a person to summon help if using a safety shower or eyewash station?	**CI Pamphlet 63**				
11.4 Are employees aware of how long it is needed to stay under the safety shower and eye wash station after exposure to chemicals?	**CI Pamphlet 63,** Section 3.3: Contact with Eyes				