SODIUM HYPOCHLORITE CUSTOMERS GENERIC SAFETY AND SECURITY CHECKLIST

Edition 3 September 2018



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1. INTRODUCTION

1.1 PURPOSE AND USE

This checklist has been prepared to help review and evaluate the safe handling of bulk sodium hypochlorite shipments (larger than a 100 gallon container) at facilities where it is received and/or used. The checklist is intended only to provide limited information to assist both the supplier of sodium hypochlorite and its customer. The checklist emphasizes key recommendations as developed by the Chlorine Institute. The checklist is intended to supplement Institute publications, not replace them and is not meant to incorporate regulatory or other requirements that may be applicable at the facility.

This checklist may be completed by either representative(s) of the sodium hypochlorite customer facility or by representative(s) of the sodium hypochlorite supplier or in partnership with each other. The check list may be modified to accommodate each facility. The Institute intends this checklist as an aid for both the supplier and the customer to help ensure the safe handling and/or use of sodium hypochlorite. Some items include 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 insure the item is fully understood.

Sodium hypochlorite use sites should be familiar with the recommendations in CI Pamphlet 96 and the *Handling Sodium Hypochlorite Safety Video* (2.1).

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 chemicals¹.

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:

ACC American Chemistry Council

AIChE American Institute of Chemical Engineers

ANSI American National Standards Institute

CCPS Center for Chemical Process Safety

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.

CFR Code of Federal Regulations

CACD Canadian Association of Chemical Distributors

CI The Chlorine Institute

CIAC Chemistry Industry Association of Canada

DOT Department of Transportation (U.S.)

EPA Environmental Protection Agency

ERP Emergency Response Plan

HAZCOM Hazard Communication

IBC Intermediate Bulk Containers

NACD National Association of Chemical Distributors

OSHA Occupational Safety and Health Administration

PPE Personal Protective Equipment

SOCMA Society of Chemical Manufacturers and Affiliates

SDS Safety Data Sheet

UN Number United Nations number

VAM Vulnerability Assessment Methodology

VPP Voluntary Protection Program

1.4 APPROVAL

The Institute's Product Stewardship Issue Team approved Edition 3 of this checklist on September 25, 2018.

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, involved reformatting, eliminating, regrouping and restating a number of questions. The checklist is now in Appendix A.

Added ANSI standards to Appendix A Section 3 "Personnel Safety and Training"

- Abridged safety shower questions and moved to Appendix A Section 6.1.4 "Unloading Station"
- Added questions about pressure relief valve and materials of construction to Appendix A Section 6.1.5
- Added questions about product identification and fall protection availability in Appendix A Section 6.2 "Unloading Process and Procedure"
- Appendix A Section 9 "Filling Drums and Totes Directly from Cargo Tank" had some of its language edited for clarification.
- Information related to IBCs, tote tanks, and drums have been incorporated into other sections of Appendix A.

2. REFERENCES

2.1 CHLORINE INSTITUTE PAMPHLETS

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

Pamphlet <u>&</u> <u>Video #</u>	<u>Title</u>
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 .
96	Sodium Hypochlorite Manual, ed. 5; Pamphlet 96; The Chlorine Institute: Arlington, VA, 2017 .
HYPO-VIDEO	Handling Sodium Hypochlorite Safely; ed. 2; HYPO-VIDEO; The Chlorine Institute: Arlington, VA, 2015 .

2.2 OTHER REFERENCES

Vulnerability Assessment Methodology (VAM) for Chemical Facilities; Sandia Laboratories

Guidelines for Analyzing and Managing the Security Vulnerabilities of Fixed Chemical Sites; Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE)

American National Standards Institute (ANSI) Z 358.1 American National Standard for Emergency Eyewash and Shower Equipment

APPENDIX A Sodium Hypochlorite Customers Generic Safety and Security Checklist

1.GENERAL CUSTOMER INFORMATION								
Company Name:								
Facility Address:								
Contact Name:								
Email:		Phone:						
Checklist completed by (name):	Title:			Date:				
Checklist Items	Yes	No	N/A	Comments				
1.1 Is the company a member of the Chlorine Institute?								
1.2 Does the facility participate in ACC or CIAC Responsible Care®, NACD or CACD Responsible Distribution or SOCMA ChemStewards® programs?								
1.3 Is this facility an OSHA, VPP Star, or Merit site? Has this facility received any other recognition for safety or environmental performance?								
2. ACCIDENTAL MIXING								
Checklist Items	Yes	No	N/A	Comments				
2.1 Does the facility have a labeling program for all containers, i.e. tanks, totes, drums, pails, bottles, sample retains and pipelines in place?								
2.2 Are non-bulk containers, i.e. sample retains, bottles, pails, drums, and totes stored in dedicated areas away from incompatible chemicals?								
2.3 Are dedicated pumps, hoses, piping, fill machines, and/or sampling devices used for sodium hypochlorite service? If no, describe program for ensuring cleanliness.								
2.4 Does the facility housekeeping exhibit evidence of spilled chemical residue?								
2.5 Does the facility review accidental mixing hazards during annual HAZCOM training?								
2.6 Are containers (tanks, totes, drums, bottles) located inside containment?								

2.7 For common containment of multiple products, are all chemicals compatible with sodium hypochlorite? List chemicals.				
2.8 For separate containment systems, does drain piping co- mingle sodium hypochlorite and non-compatible chemicals? List comingled chemicals.				
2.9 Describe system employed to isolate different chemical containment drains.				
2.10 Are receiving pipelines labeled to identify contents as Hypochlorite Solutions, UN 1791?				
2.11 Is there validation that the flexible hose is connected to the correct unloading line before unloading commences?				
2.12 Is the sodium hypochlorite receiving pipeline isolated from other chemical receiving pipelines?				
2.13 For nearby pipelines, describe the mechanism used to prevent accidental cross-hooking by delivery personnel, i.e. differing connectors, unique lock and keys, procedural controls, labeling, etc.				
2.14 Is a customer representative, who is knowledgeable about sodium hypochlorite, assigned to review bills of lading for product name, quantity, UN number and tank trailer number, and identify the correct unloading station connector before sodium hypochlorite is unloaded?				
3. PERSONNEL SAFETY & TRAINING				
Checklist Items	Yes	No	N/A	Comments
3.1 Does the facility have a sodium hypochlorite-specific training program including documentation for employees, new hires, and contractors?				
3.2 Are accidents and incidents investigated and reviewed with operating personnel?				
3.3 Is a current SDS readily available for sodium hypochlorite?				
3.4 Are warning signs, wall charts, and/or other				
safety information used and visible? 3.5 Does the facility have a Personal Protective				

3.6 Does the facility have a policy for use of respiratory protection? (CI Pamphlet 65)				
3.7 Are safety showers and eyewash stations adequately located and easily accessible from all product-handling areas?				
3.8 Are the safety showers and eyewash stations inspected weekly for proper operation with inspections documented? (ANSI Z 358.1)				
3.9 Is the water temperature within an acceptable range (60-100°F, ANSI Z 358.1)?				
3.10 Is first-aid information available?				
4. EMERGENCY RESPONSE				
Checklist Items	Yes	No	N/A	Comments
4.1 Is there a site emergency response plan (ERP) which includes sodium hypochlorite that is up to date and reviewed annually?				
4.2 Have emergency responders received training in accordance with local, state or provincial, and national requirements?				
4.3 Are periodic drills performed? (CI Pamphlet 64)				
4.4 Is the ERP coordinated with local emergency groups? (CI Pamphlet 64)				
4.5 Is the emergency responder equipment inspected regularly, maintained in suitable condition, and are inspections documented? (CI Pamphlet 65)				
4.6 Does the ERP appropriately address communication with outside agencies, the media, and the general public? (CI Pamphlet 64)				
4.7 Are mitigation techniques taught for minor spills?				
5. SECURITY				
Checklist Items	Yes	No	N/A	Comments
5.1 Has the facility conducted a vulnerability assessment? (See Vulnerability Assessment Methodology (VAM) for Chemical Facilities, Sandia Laboratories; Guidelines for Analyzing and Managing the Security Vulnerabilities of Fixed Chemical Sites, Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE)				

5.2 Has the facility implemented the appropriate countermeasures?							
5.3 Is security awareness training provided to	\vdash	H	H				
employees and documented?							
6. TANK TRUCK UNLOADING OPERATION							
Checklist Items	Yes	No	N/A	Comments			
6.1 UNLOADING STATION							
6.1.1 Can the truck safely park inside the site perimeter?							
6.1.2 Is a secondary containment present for all hose connections?							
6.1.3 Is a secondary containment present for truck equipment?							
6.1.4 Is there a safety shower and eyewash fountain in the area?							
6.1.4a Are they operational?							
6.1.4b Are they inspected regularly with inspections documented?							
6.1.4c Are they within 10 seconds or approximately 55 feet of access?							
6.1.4d Are they clear of obstructions?							
6.1.4e Are they at the same level as the hazard?							
6.1.4f Are they located out of the "hot zone?"							
6.1.4g Are they connected to an alarm?							
6.1.4h Is the water temperature within an acceptable range (60-100°F)?							
6.1.4i Is a safety shower and eyewash fountain identified for the driver and tested prior to commencing the product transfer?							
6.1.5 If compressed air is used to unload, is the air line equipped with a regulator set below 25 psig?							
6.1.5a Is there a pressure relief valve in the line downstream of the regulator set slightly higher than the regulator should the regulator fail?							
6.1.6 Is compressed air filtered to remove oil and particulate contaminants?							

6.1.7 If the compressed air line is metallic, is filtration installed at the discharge end to avoid contamination?				
6.1.7a Is the compressed air line material of construction compatible with the sodium hypochlorite being unloaded?				
6.1.8 Is adequate lighting provided for night-time unloading?				
6.2 UNLOADING PROCESS AND PROCEDURE				
Checklist Items	Yes	No	N/A	Comments
6.2.1 Is the unloading procedure documented?				
6.2.2 Is the buddy system followed until the product flow has been established and at line disconnection?				
6.2.3 If the unloader is left alone during the product transfer, is he provided with a means to communicate with plant personnel in the event of an emergency?				
6.2.3a Is the communication means tested before unloading commences?				
6.2.4 Is a checklist used to document the important steps of the unloading process?				
6.2.5 Is the bill of lading reviewed for the following elements: product name, quantity, UN number and tank trailer number?				
6.2.6 Are wheel chocks applied prior to commencing the product transfer?				
6.2.7 Is the tank truck brake applied prior to commencing the product transfer?				
6.2.8 Is a safety perimeter limiting access to the unloading area established?				
6.2.9 Is the tank level monitored adequately prior to and during unloading to prevent the risk of overflowing the tank?				
6.2.10 Is the unloading connection point properly identified with product name or UN number?				

6.2.10a Is there validation that the flexible hose is connected to the correct unloading line before unloading commences?				
6.2.11 Is the unloading equipment visually inspected prior to commencement of unloading (flexible hose, unloading connections, etc.)?				
6.2.12 Is adequate Personal Protective Equipment used during the transfer operation? (CI Pamphlet 65)				
6.2.12a If tank trailer sampling is required, are proper PPE and sampling devices used? (CI Pamphlet 65)				
6.2.12b Is fall protection available when accessing the top of the tanker?				
6.2.13 If a pump is used, is the trailer vented to the atmosphere prior to commencing the transfer and during transfer?				
6.2.14 Are lines clear of product prior to disconnecting?				
6.2.15 Are any drips from unloading lines captured in a pail or by the containment system?				
6.2.16 Are unloading connections secured when the product transfer is completed?				
6.2.17 Are unloading hoses secured and stored when the product transfer is completed?				
7. STORAGE TANK				
Checklist Items	Yes	No	N/A	Comments
7.1 Is the tank located in a secondary containment able to handle 110% of the tank capacity?				
7.2. Is the tank containment discharging to a proper area?				
7.3 Is the tank containment discharge procedure adequate?				
7.4 Is the sodium hypochlorite containment system common to other chemicals?				
7.5 Is the tank made of adequate materials of construction? (CI Pamphlet 96)				

7.6 Is the tank equipped with a vent sized at least twice times the diameter of the inlet line?				
7.7 Is the tank exhaust directed to an appropriate location?				
7.8 Is the tank equipped with an overflow line at least 1.5 the size of the inlet pipe, directed to tank containment and designed to minimize splashing?				
7.9 Is the tank inlet leading to the top of the tank?				
7.10 Is tank piping secured?				
7.11 Is the tank labeled with the product name?				
7.12 Is the tank anchored?				
7.13 Is the tank equipped with a level indicator?				
7.13.1 Is the level indicator in direct view of the driver/unloading personnel?				
7.14 Is there a documented, periodic inspection or replacement procedure in place for the storage tanks?				
8. PIPING AND PROCESS EQUIPMENT				
Checklist Items	Yes	No	N/A	Comments
8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)?	Yes	No .	N/A	Comments
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8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)?	Yes	No .	N/A	Comments
8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)? 8.2 Are pipes adequately supported? 8.3 Are pipes labeled with the product name	Yes	No		Comments
8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)? 8.2 Are pipes adequately supported? 8.3 Are pipes labeled with the product name and the flow direction? 8.4 Are pipes subject to an adequate inspection	Yes	No		Comments
8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)? 8.2 Are pipes adequately supported? 8.3 Are pipes labeled with the product name and the flow direction? 8.4 Are pipes subject to an adequate inspection or replacement program? 8.5 Are the inspections and replacements	Yes			Comments
8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)? 8.2 Are pipes adequately supported? 8.3 Are pipes labeled with the product name and the flow direction? 8.4 Are pipes subject to an adequate inspection or replacement program? 8.5 Are the inspections and replacements documented? 8.6 Are flange connections protected with	Yes			Comments
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8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)? 8.2 Are pipes adequately supported? 8.3 Are pipes labeled with the product name and the flow direction? 8.4 Are pipes subject to an adequate inspection or replacement program? 8.5 Are the inspections and replacements documented? 8.6 Are flange connections protected with flange guards? 8.7 Is the unloading connection adequate? 8.7.1a Is the material of construction				Comments
8.1 Are pipes made of compatible materials (metal-free unless titanium or lined metal)? 8.2 Are pipes adequately supported? 8.3 Are pipes labeled with the product name and the flow direction? 8.4 Are pipes subject to an adequate inspection or replacement program? 8.5 Are the inspections and replacements documented? 8.6 Are flange connections protected with flange guards? 8.7 Is the unloading connection adequate? 8.7.1a Is the material of construction acceptable for the product?	Yes			Comments

Checklist Items	Yes	No	N/A	Comments
9.1 Does the facility use local ventilation? (CI Pamphlet 96)				
9.2 Describe PPE used during container filling. (CI Pamphlet 65)				
9.3 Is the entire filling operation (bulk container, hose/pump, and receiving containers) located inside containment?				
9.4 Are all sodium hypochlorite drums and totes DOT compliant (clean and pressure tested)?				
9.5 Are the receiving containers 'splash-filled' or filled by an automated filling machine? (Please circle 'splash-filled' or 'filled by an automated filling machine'.)				
9.6 For 'splash-fill' operation, does the filling hose have a shutoff valve and/or 'deadman's switch' located near the filling operator?				
9.7 Are containers filled by weight or volume? Describe method of determining when container is full?				
9.8 Is the trailer unloaded with air pad or pump?				
9.9 Is the product being packaged an EPA registered product? If so, is appropriate labeling utilized (EPA product number and Registration number?)				
9.10 Is tank trailer hose connected to filling station via fixed, secured piping which is adequately supported?				
9.11 Identify amount of hose required to connect tank trailer to filling station, i.e. one-20 foot section, two-20 foot sections, etc.				
9.12 If unloading product from tote tanks on transport vehicle, has the proper DOT Special Permit been obtained and are its requirements being followed?				
9.13 Is a shower and eyewash station readily accessible?				