

Spill
Prevention
Operations
Technology
Series

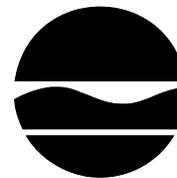
SPOTS Memo #11

**Chemical Bulk Storage Regulations
Technical Guidance for Spill Prevention**

Prepared by:
New York State Department of Environmental Conservation
Division of Spills Management
Bureau of Source Control

August 10, 1994

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October 12, 1989

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MEMORANDUM

TO: Regional Spill Engineers, Bureau Directors, Section Chiefs

SUBJECT: Division of Spill Management
Spill Prevention Operations Technology Series (4.1.11)

Chemical Bulk Storage Regulations - Technical Guidance for Spill Prevention
(Originator P. Sausville/J. Sibblies)

I. **PURPOSE**

This memorandum on the technical guidance requirements set forth by the Chemical Bulk Storage (CBS) regulations, 6 NYCRR Part 596.5, is a guide to staff who will be reviewing submittals required by that Part and responding to questions from the regulated public.

II **DISCUSSION**

Beginning July 15, 1989 manufacturers or distributors of hazardous substances were required to supply the owners and operators of bulk storage tanks with technical guidance and recommended practices (best management practices-BMP's) for the proper storage and handling of such substances. The requirements include information on the following:

1. Physical and Chemical Properties Data;
2. Design and Construction of Storage Tank;
3. Conditions for Safe and Proper Substance Storage;
4. Recommended Storage Equipment;
5. Equipment Inspection and Maintenance Procedures;
6. Safety Precautions; and
7. Emergency Response.

Manufactures and distributors are primary and vital sources of information on the proper storage of hazardous substances which they produce and/or sell. Because each chemical or its mixture has its own unique characteristics, the manufacturer may be the only authoritative source of chemical specific information and is in the best position to offer guidance on storage and handling practices.

It is the purpose of the above regulation to stimulate manufacturers to develop BMP's where current guidance is incomplete or weakly developed, and to promote a dialogue on spill prevention practices between the manufacturer and buyers of bulk quantities of hazardous substances.

The Department encourages manufacturers and distributors to pool their knowledge and resources and to work with professional, industrial and scientific organizations to develop industry standards and BMP's. Groups such as the American Institute of Chemical Engineers, Chemical Manufacturers Association, Center for Chemical Process Safety or New York State Chemical Alliance may play a role in coordinating or developing standards which are consistent and reflect the state-of-the-art in storage and handling.

Wherever appropriate, manufacturers should guide buyers to other sources of information necessary for proper storage. Industry standards should be referenced such as those developed by the American Petroleum Institute, Chlorine Institute and American Society of Mechanical Engineers.

Manufacturers may also notify buyers that the DEC's Chemical Bulk Storage Regulations also contain standards for handling and storing hazardous chemicals, inspection requirements and standards for new construction. Manufactures' guidance should be at least as stringent as the DEC regulations, which set forth standards for compliance in New York State.

III. **GUIDANCE**

The seven (7) previously listed items comprise the minimum regulatory requirements under 6 NYCRR Part 596.5 (b). Following is a discussion of each item in the order it is listed.

1. Physical and Chemical Properties

Some material safety data sheets (MSDS's) supplied by manufacturers and distributors do not provide all of the data on physical and chemical properties required by section 596.5 (b)(1) of the regulations. Where the MSDS does not provide the required information, buyers should be given supplemental information

Technical guidance should contain as much of the following data as is available on any hazardous substance contained in a chemical product.

- The Chemical Abstract Service (CAS) Registry Number
- The chemical name and any synonyms used
- Molecular formula and weight
- State of substance at ambient conditions
- Appearance and odor
- The mixture composition of the hazardous substance expressed in volume or Weight percent
- Melting Point (freezing point), boiling point, sublimation temperature
- Liquid and/or vapor densities
- Solubility
- Hazardous products formed from decomposition
- Vapor pressure
- Odor detection limit(s)
- Flash point
- Department of Transportation (DOT) hazardous substance classification
- Autoignition temperature

- Upper and lower explosive limits
- Incompatible substances and reaction consequences
- Other reactivity data such as National Fire Protection classification codes
- Neutralizing agents
- Fire extinguishing media
- Exposure standards and recommendations such as permissible exposure level (PEL's) and threshold limit values (TLV's)

2. Design and Construction of Storage Systems

Recommendations for storage equipment design are also essential in reducing risks at a bulk storage site. Wall thickness of the tank, the locations of openings and entrances to the tank, positioning of the tank (vertical vs horizontal) and the type of foundation are all factors which should be dealt with in a technical guidance manual. Where substances are to be stored in customized storage systems, advisories to the buyer should be included in the guidance documents, pointing out that a custom design by an experienced engineer is necessary.

The reactivity and corrosivity of a substance limits the material which can be used for construction of the storage system. For example, sulfuric acid is compatible with carbon steel at concentrations of 70-99 %, but at higher and lower acid concentrations carbon steel undergoes corrosion and special materials of construction must be used. The tanks, pipes, gaskets and other equipment used to store a hazardous substance should ideally be made of a durable material, resistant to any reaction with the substance it stores. The tank owner must be made aware of materials which are compatible and incompatible with a hazardous substance.

3. Conditions For Substance Storage

The state or phase of a substance primarily depends on the temperature and pressure conditions to which it is subjected. Hazardous substances should be kept under conditions such that their most stable states are maintained. The regulations require that information regarding the optimum conditions for storage be supplied to the buyer. This must include:

- Temperature;
- Pressure;
- Relative humidity;
- Light conditions; and
- Proximity to other stored substances with which reactions might occur.

Compounds with high energy levels (high heat of formation) should be identified and specially addressed in technical guidance if there is the possibility of a disassociation reaction resulting from poor storage conditions.

4. Recommended Storage Equipment

Guidance should include recommendations on storage tanks and ancillary equipment best suited to operate under the conditions to which they would be subjected, i.e., operating unities should not be stressed, strained or overloaded to any degree beyond their optimum performance levels.

Technical guidance should include recommendations which allows for monitoring and control of the storage system. Needs for pumps, gauges, piping, valves gasket materials, secondary containment, curbs, liners, hoses, overfill alarms, rupture discs, vents, automatic shut-off devices, monitors and other safety equipment should be identified.

Advice should be given on labeling or color coding equipment in a facility in order to reduce the risk of human error.

Cathodic protection systems should be recommended, where applicable, to deter tank and piping corrosion. The EPA Underground Storage Tank (UST) regulations require that underground steel tanks be cathodically protected. Aboveground carbon steel tanks which rest on the ground should also have cathodic protection. The type of soil the tank is in contact with is a determining factor on the performance requirements of the cathodic system to be employed.

5. Inspection And Maintenance Procedures

The scope and frequency of inspection and maintenance are often dependent on the material being stored. Prompt inspection and maintenance are key safety precautions and must be adequately dealt with in technical guidance manuals. Recommendations should be given on the scope and regulatory of and procedures for general and major equipment inspections. These guidelines should be as stringent as or more stringent than those in the CBS regulations.

The owner or operator of a storage facility must frequently test or inspect equipment of the facility including storage tanks, transfer stations, hoses, secondary containment systems, gauges, alarms, cathodic protection systems, piping systems, pumps, valves, inspections must identify cracks, areas of wear, corrosion and thinning, separation or swelling of insulation on tanks or piping, and malfunctioning equipment (especially safety interlocks, trips, automatic shut-offs, leak detectors and other monitoring, warning or gauging equipment). Maintenance of the above described items should be performed on a schedule which parallels inspection results.

The frequency and extent to which major equipment inspections should be carried out must also be contained in technical guidance. Internal tank inspection should be dealt with thoroughly with mention made to safety procedure, such as ensuring that vapor content in the tanks are at or below the required minimum level.

6. Safety Precautions

Hazardous substances must be handled with great caution in order to prevent accidental releases. Details on all aspects of handling, for safety purposes, should be dealt with in a technical guidance manual, and should include the following:

- Safety precautions and special preparations necessary for transporting or using the substance;
- Warnings in terms of preventative measures, potential risks and resulting effects of major mishaps;
- Specific procedures and safety precautions for personnel who handle or load or unload bulk tanks; and
- Location of safety showers, water hydrant and hose, eye wash fountain, etc. in areas where product is handled.

7. Emergency Response

Though safety procedures might be adhered to, accidental releases of hazardous substances do occur, and therefore provisions must be made to deal with such eventualities. A section outlining spill and other emergency response procedures must be included in the technical guidance manual. Information on short term corrective action for the immediate mitigation of crisis situations should be clearly stated.

Clean-up of a spill should be swiftly and completely carried out in an effort to minimize the spread of environmental contamination. Instruction should contain information on such topics as:

- neutralizing agents and proper application procedures;
- the removal of potential ignition sources;

- proper disposal procedures for discharge products as well as for contaminated soils;
- evacuation distance;
- vapor reduction or control including ventilation requirements;
- precautions to be employed by clean-up personnel with regard to the level of protective clothing required and methods for minimizing any further contamination of the environment.

Guidance from manufacturers and distributors may also point out the importance of reporting releases to Federal and State environmental agencies. In New York State releases of hazardous substances at or above their reportable quantities (RQ's) must be reported to the DEC spill hotline {(800) 457-7362} within two (2) hours of their discoveries or occurrences, pursuant to 6 NYCRR Part 595.2.

IV

DEC REVIEW

The information provided here is a guide for regulatory agency personnel in reviewing and responding to questions about technical guidance manuals. Because it is public information, those required to develop technical guidance may elect to use it as a general guide to the extent and depth of information that is required under the requirements of Part 596.5.

All pertinent information for the safe storage and handling of a hazardous substance or a mixture thereof should be contained in a single bound guidance manual, and a current copy filed with DEC as of July 15, 1989. Guidance should be sent to: Paul J. Sausville, P.E. Chief, Regulation Section, Room 340, NYSDEC, 50 Wolf Road, Albany, NY 12233-3750. The DEC should also be informed of all subsequent updates as soon as they are completed.

Upon submittal of the guidance material, DEC will review it to determine if the seven items required by Section 596.5(b) have been addressed. DEC will not approve or disapprove submittals, nor will the Department review the contents of the guidance for accuracy, validity or completeness except to see if the seven topical requirements of the regulations have been addressed. Appendix A is a checklist of the guidance which must be covered. This checklist will be used by DEC to review submittals.



Salvatore Pagano, P.E.
Director
Division of Spills Management

TECHNICAL GUIDANCE CHECKLIST

Company: _____

Substance: _____

Contact: _____

CAS #: _____

Date Submitted: _____

Section 596.5(b) Item #		Status		Additional Information Required
		Addressed	Not Addressed	
IV	Physical & Chemical Data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> CAS Number <input type="checkbox"/> Chemical Name/Mixture <input type="checkbox"/> Physical & Chemical Characteristics <input type="checkbox"/> Toxic & Hazardous Properties
IV	Construction & Compatibility Data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Recommended Construction Material <input type="checkbox"/> Material Compatibility <input type="checkbox"/> Prohibited Construction Material <input type="checkbox"/> Standards for Storage Tank Design
IV	Conditions for Safe & Proper Storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Temperature/Pressure <input type="checkbox"/> Light Conditions/Relative Humidity
IV	Recommended Storage Equipment	<input type="checkbox"/>	<input type="checkbox"/>	(Ex.) Monitoring Devices, Pumps, Valves Secondary Containment
IV	Testing, Inspecting, and Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Procedures & Schedules <input type="checkbox"/> Internal Tank Inspection
IV	Safety Precautions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Handling of Bulk Devices
IV	Spill and Emergency Response Procedures	<input type="checkbox"/>	<input type="checkbox"/>	