

VISTA CHEMICAL COMPANY - ABERDEEN PLANT**PROCESS SAFETY MANAGEMENT MANUAL****INTRODUCTION: APPLICABILITY DETERMINATION**

Approved by: _____
Plant Manager

Date: _____

1.0 SCOPE

This document defines the requirements and methods for determining applicability and establishing the extent of coverage by the OSHA Process Safety Management (PSM) regulation for Highly Hazardous Chemicals, 29CFR 1910.119. It also describes the extent of coverage at the Aberdeen Plant, provides a basis for these determinations, and outlines procedures for developing additional support documentation.

2.0 PURPOSE

The purpose of this document is to determine if and to what extent PSM applies to various processes at the Aberdeen Plant and to develop documentation to support this determination.

3.0 TECHNICAL BASIS**3.1 Process For Determination of Facility Coverage**

The Aberdeen Plant shall use the methodology outlined in this paragraph to determine if PSM applies to particular process.

3.1.1 General

3.1.1.1 PSM applies to a process which involves a listed highly hazardous chemical (HHC) at or above the threshold quantity (TQ) and at or above the minimum concentration. Reference: Appendix A of the PSM regulation.

3.1.1.2 PSM applies to a process which involves a flammable liquid or gas [Reference: 29 CFR 1910.1200 (c)] on site in one location, in a

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quantity of 10,000 pounds or more, with the following exceptions:

- a. Hydrocarbon fuels used solely for workplace consumption as a fuel provided that the fuels are not a part of a process containing another highly hazardous chemical covered by the OSHA PSM standard.
- b. Flammable liquids stored in atmospheric tanks (where tank pressure does not exceed 0.5 psig) or transferred which are kept below their normal boiling point without the use of chilling or refrigeration. To be exempt, these storage tanks will not be interconnected or located such that they will be involved in a catastrophic event in a covered process.

3.1.1.3 PSM applies to a laboratory or research operation involving at least the threshold quantity of one or more highly hazardous chemicals (HHC).

3.1.1.4 PSM does not apply to normally unoccupied remote facilities. "Normally unoccupied" means that no personnel are permanently stationed at the facility. Staff and workers who only periodically visit the facility to perform maintenance, take samples, adjust equipment, perform inspections or other similar tasks are not permanently stationed employees.

The intent behind "remote" is that, due to the isolation of the process from employees by distance, such employees would not be affected by the consequence of a catastrophic release.

Therefore, the remote location must be geographically separated from other facilities and employees would not be affected by an explosion, vapor cloud of toxic gas, or other consequence of an uncontrolled release at the remote site. To determine if a piece of equipment is remote, use the "radius of exposure" calculated in the DOW FIRE & EXPLOSION INDEX HAZARD

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if available.

- 3.1.1.5** Carriage of a covered HHC onto a worksite at which there is a covered process may be covered by the PSM standard depending on the circumstances in each case. Vista is responsible for providing safe workplace access for the commercial carrier to and from, and at the loading and unloading site(s). This carriage would be covered by OSHA standards to the extent that it is not covered otherwise by the Hazardous Material Regulations of the Department of Transportation (DOT) (See 49 CFR Subchapter C and particularly Part 177-Carriage on Public Highway.) These DOT regulations cover containment design, construction, maintenance (including repairs) and associated carriage operations. Operations regulated by DOT include carrier loading and unloading, cargo transfer hose connection and disconnection, attendance by a qualified person during loading and unloading associated training.

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The amount of HHC carried onto the worksite in a DOT regulated vehicle is not included for the purpose of determining whether there is a threshold quantity or greater amount in a worksite process. As such, DOT regulated delivery to a process which has a capacity less than threshold amount would not be covered by the PSM standard.

3.1.2 Determination of Coverage Process**3.1.2.1** Coverage Due to the Presence of an HHC.

The following methodology will be used to determine if PSM due to the presence of an HHC listed in Appendix A of the PSM regulation assuming no exemptions apply.

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- a. Determine if there are any HHC's within the process. If no HHC's are found, then determine if PSM coverage is triggered by the presence of either a flammable liquid or

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gas per Sections 3.1.2.2 and 3.1.2.3 of this standard.

- b. Determine the minimum concentration that triggers coverage as described in Appendix A of the OSHA PSM regulation. (Note: If no concentration is shown in Appendix A, then use the "commercially available" concentration as the minimum. For the few HHC's that have no listed concentration and are not commercially available, then there is no minimum concentration. For this small group of HHC's, any concentration is subject to the PSM regulation.)
- c. Identify the equipment (excluding any exempted equipment as described in Section 3.1.1.4 of this standard) that has the HHC present at or above the minimum concentration.
- d. For each piece of equipment that contains an HHC in concentrations at or above the minimum, determine the "interconnected" and "proximate" equipment that also contains the HHC at or above the minimum concentration.
- e. Aggregate the amount of HHC present in the equipment identified in c and d above. If the aggregated amount exceeds the TQ, then OSHA PSM applies to the process. If the process is covered by PSM, then determine the covered boundaries as described in Section 3.2.
- f. For discussion purposes, the aggregated group of equipment from 3.1.2.1e is the "core" group of equipment.
- g. Repeat this process for each HHC within the process.

3.1.2.2 Coverage Due to Presence of Flammable Liquids.

- a. Determine if there are any flammable liquids in the process. If none are found, then determine if PSM coverage is triggered

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- by the presence of a flammable gas per Section 3.1.2.3 of this standard.
- b. Identify the equipment (excluding any exempted equipment as described in Section 3.1.1.2 and 3.1.1.4 of this standard) that contain flammable liquids and aggregate.
 - c. Identify all "interconnected" and "proximate" equipment containing flammable liquids and aggregate.
 - i. Quantities of flammable liquids in storage are considered a part of the process if the storage tanks are interconnected with the process, or if they are sufficiently near the process that an explosion, fire, or release could reasonably involve the storage area combined with the process in quantities sufficient to meet the threshold amount of 10,000 lbs.
 - ii. Flammable liquids that are stored on a tank farm where only transferring and storage are done are not covered by the OSHA PSM standard, but they are covered by 29 CFR 1910.106.
 - iii. Flammable liquids stored in 55-gallon drums in aggregate quantities greater than 10,000 pounds would be considered exempt as storage in atmospheric tanks (notwithstanding the definitions of "containers" and "tanks" in 29 CFR 1910.106) unless the drums are near a covered process.
 - d. Aggregate the amount of flammable liquids present in equipment identified in b and c above. If this aggregated amount exceeds 10,000 pounds, then OSHA PSM applies to the process. If the process is covered by PSM, then determine the covered process boundaries as described in Section 3.2 of this standard.

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- e. For discussion purposes, the group of equipment from 3.1.2.2 is the "core" group of equipment containing flammable liquids.

3.1.2.3 Coverage Due to Presence of Flammable Gases.

- a. Determine if there are any flammable gases in the process. If none are found and it has been determined that coverage is not applicable due to presence of highly hazardous chemicals or flammable liquids, then the OSHA PSM standard does not apply to the process.
- b. Identify the equipment (excluding any exempted equipment as described in Section 3.1.1.4 of this standard) that contains flammable gases and aggregate.

For flammable gases, the amount of the non-flammable components are totalled with the flammable components to determine the amount of flammable gas present.

- c. Identify all "interconnected" and "proximate" equipment containing flammable gases and aggregate.
- d. Aggregate the amount of flammable gases present in equipment identified in b and c above. If this aggregated amount exceeds 10,000 pounds, then OSHA PSM applies to the process. If the process is covered by PSM, then determine the covered process boundaries as described in Section 3.2 of this standard.
- e. For discussion purposes, the group of equipment from 3.1.2.2d is the "core" group of equipment containing flammable gases.

3.2 Process For Determining Extent of Coverage (Covered Process Boundaries)

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The guiding principle in deciding PSM coverage is to extend the boundaries of the covered process to those pieces of equipment and systems that may cause or contribute to a catastrophic event. Also, the equipment and systems present to prevent, detect, or mitigate a catastrophic event involving a chemical or flammable liquid or gas regulated by PSM are included in the covered process.

For each group of "core" equipment identified in 3.1.2.1, 3.1.2.2 and 3.1.2.3, determine the extent of the covered process (covered process boundaries) according to the following process:

3.2.1 To the equipment in the "core" groups, add the "safeguards" and "emergency shutdown systems" that are essential to the prevention or management of catastrophic events that involve a HHC or flammable liquid or gas and any "necessary function support system" essential to the covered process.

3.2.1.1 To assist in deciding if a support system is "necessary function support system" equipment in the covered process, use the following guidelines:

- a. Consider the functional and mechanical failure of each support system. The system is included if the failure has the real potential to cause a catastrophic event.
- b. For those systems where the catastrophic potential for failure is mitigated by highly effective, reliable, redundant, and proven design, and these are not the last line of defense then the system is not included in the covered process boundaries.
- c. If the failure of a system causes the enactment of emergency procedures in the covered process and the procedures result in going to the last line of defense, then the system will become part of the covered process.

3.2.2 The "core" equipment group(s) and the equipment and from 3.2.1 above constitute the entire covered process and define the covered process boundaries.

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3.3 Change To Facility Coverage Or Covered Process Boundaries.

- 3.3.1** Changes in a facility, changes in the PSM regulation, new or revised OSHA interpretations, changes to a process or its configuration, the introduction of new chemicals, and changes in the quantities of existing chemicals used may impact the extent of coverage, create or eliminate covered process areas, create or eliminate covered facilities, or may cause changes to the covered process boundaries.
- 3.3.2** Each facility will establish review procedures to assess changes in PSM coverage due to changes in the PSM regulation, changes to the facility, the introduction of new chemicals, and new or revised OSHA interpretations.
- 3.3.3** The Aberdeen Plant has included in its management of Change Procedures an item that evaluates whether the change alters the covered process boundaries and initiates the appropriate actions.
- 3.3.4** All covered process boundaries determined by this standard will be reviewed by the PHA team as part of its hazard analysis of the covered process. The team may recommend changes to the boundaries. These recommendations will be resolved in a manner similar to that used for other PHA findings.

4.0 GENERAL APPLICABILITY**4.1 Highly Hazardous Chemicals**

The following table lists the chemicals processed at the Aberdeen Plant which meet the definition of a highly hazardous chemical per 29CFR 1910.119:

<i>Chemical Covered</i>	<i>Coverage Basis</i>	<i>Threshold Quantity</i>	<i>Maximum Intended Inventory</i>
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Vinyl Chloride Monomer (VCM)	flammable gas	10,000 lb	6 MM lb
Chlorine	listed chemical	1,500 lb	3,000 lb 15 mm

Propane

listed chemical

M.T.N. 1-25-96

4.2 Covered Processes

At the Aberdeen Plant, regulation 29CFR 1910.119 covers the following processes and systems:

Covered Process	P & ID Nos. or Dept. Code	Basis For Coverage
VCM Tank Farm and Unloading	VS-090101-05	VCM Storage
Old Module/ERS	OM-090100-30	VCM Process
New Module	NM-090100-31	VCM Process
Slurry Blend Tanks	DY-090100-05	Interconnected to VCM processes
Rotary Dryers	DY-090106-10	Proximate to blend tanks - contain propane
Incinerators	DY-090133-36	Contain VCM
Cooling Water System	UT-090112-15	Failure creates emergency in reactor modules
Cooling Tower Auto Chlorination	UT-090117	HHC; proximate to reactors
Chlorine at Water Plant	WP-090106	HHC; above TQ
Steam Distribution	BP-090111-13	Interconnected to VCM processes
Condensate Return	BP-090114-14	Interconnected to VCM processes
Fire Water Deluge	UT-090118	Safeguard system; used to mitigate catastrophe
Propane System	BP-090100-02	Interconnected to dryers and incinerators

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Plant Gas Distribution	UT-090102	Interconnected to dryers and incinerators
Boiler System	BP-090103-10	Interconnected to propane system
Emergency generators		Emergency system for power outage
Catalyst Day Freezers		Proximate to reactors
Process Sewers		Interconnected to VCM processes

4.3 Excluded Processes

The following processes in the Aberdeen Plant are excluded from 29CFR 1910.119. A brief basis for exclusion is given for each process. A comprehensive equipment list and descriptive narrative of coverage may be found in the PSM Applicability Report located in the central PSM file room.

Fluid Bed Dryer and Equipment (DY-090111-14) -

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Resin Reclam System (DY-090115-17) -

This process does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment involving a highly hazardous chemical. This system could not cause or contribute to a catastrophic incident involving a highly hazardous chemical.

Silos, Hook-ups, and Railcar Wash (DY-090121-32) -

This process does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment involving a highly hazardous chemical. This system could not cause or contribute to a catastrophic incident involving a highly hazardous chemical.

Prairie Meter Station/MS Valley Meter Station (UT-090100-01) - These processes do not

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contain a highly hazardous chemical, nor are they interconnected with any equipment involving a highly hazardous chemical. Due to their remote location with respect to covered processes, a catastrophic incident (such as an explosion) involving these processes could not cause or contribute to a catastrophic incident involving a highly hazardous chemical.

Breathing Air System (UT-090103-06) -

This process does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment involving a highly hazardous chemical. The system could not cause or contribute to a catastrophic incident involving a highly hazardous chemical.

SA Module (SA-090100-12) -

This process does not contain any highly hazardous materials. Even though it is interconnected to the Old and New Module covered processes, the SA Module is connected via lines which do not contain VCM. Various interlocks and safety devices preclude the possibility of the SA Module causing or contributing to a catastrophic incident involving a highly hazardous chemical.

Centrate System, Service Water (DY-090118-20) -

This process does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment involving a highly hazardous chemical. The system could not cause or contribute to a catastrophic incident involving a highly hazardous chemical.

Instrument Air (UT-090107-11) -

This system does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment in a highly hazardous chemical service. A failure of the process could not cause or contribute to a catastrophic incident since the equipment in the plant's covered processes fails in a safe condition upon loss of instrument air.

Cooling Water Chemical Feed (UT-090116) -

This system does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment in a highly hazardous chemical service. Even though this process is connected to and is a support system of the cooling towers, which are covered processes, the failure of the feed system could not cause or contribute to a

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catastrophic incident involving a highly hazardous material.

Catalyst Storage Freezers (SA-090113) -

This system does not handle any highly hazardous material, nor is it interconnected with any piping or equipment involving a highly hazardous chemical. The system could not cause or contribute to a catastrophic incident involving a highly hazardous chemical. High temperature alarms alert the operators to any problems, and in the unlikely event of an explosion, a blast wall provides protection to the surrounding areas.

Water Plant (WP-090100-05, WP-090107-08) -

This system does not handle VCM or any other highly hazardous material, nor is it interconnected with any piping or equipment in a highly hazardous chemical service. The water plant is interconnected with the chlorine addition system, but coverage of the chlorine system extends only to the point where the chlorine/water line enters the water plant. The water plant could not cause or contribute to a catastrophic incident involving chlorine. The water plant is also proximate to the boiler plant, but it could not cause or contribute to a catastrophic incident involving the boilers.

Electric Power Supply -

This is a support system to covered processes, but its failure will not lead to emergency systems that are the last line of defense against a catastrophic incident. When power fails, emergency generators are activated and supply the power necessary to kill the reactors. Even if the generators fail, reactors can be killed manually.

Stormwater Sewer System, Wastewater Treatment System -

These systems do not handle VCM or any other highly hazardous material, nor are they interconnected with any piping or equipment involving a highly hazardous chemical. These systems could not cause or contribute to a catastrophic incident involving a highly hazardous chemical.

Laboratory Systems -

The lab area contains flammable liquids and gases well below the 10,000 lb threshold limit. Due to their remote locations with respect to the covered processes, they could not cause or contribute to a catastrophic incident.

Maintenance and Warehouse -

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These departments do not store or handle VCM or any other highly hazardous chemical, nor are they interconnected with any piping or equipment containing a highly hazardous chemical. These areas could not cause or contribute to a catastrophic incident.

Compound and Plasticizer -

These areas do not handle VCM or any other highly hazardous material, nor are they interconnected with any piping or equipment in a highly hazardous chemical service. These areas are not within the radius of exposure of any covered equipment. They could not cause or contribute to a catastrophic incident.

5.0 FURTHER DOCUMENTATION

- 5.1** The Aberdeen Plant will develop and maintain a PSM Applicability Report to be retained in the central PSM file room.
- 5.2** The Process Safety Engineer will have the responsibility of coordinating periodic updating of all information contained in the report.
- 5.3** The PSM Applicability Report will include:
 - a. A list of equipment and systems in the covered process that includes:
 - i. Equipment name, description and number
 - ii. Indication of coverage status (covered, not covered)
 - iii. Brief basis for inclusion in coverage or exclusion (HHC, flammable liquid or flammable gas above TQ, interconnected equipment, proximate equipment, safeguard equipment, emergency shut down equipment, necessary function support equipment).
 - b. Marked P&ID's that show the covered equipment. The P&ID's show interconnecting piping and assist visualizing what is not possible to visualize in equipment lists. When changes are made or HAZOP are conducted, these P&ID's can be used to decide if any changes to the covered process boundaries has occurred.

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- c. A narrative of the coverage that provides a general reference of the extent of coverage in the unit. This document will be useful for employee training, audits, and possible OSHA inspection. The narrative shall include:
 - i. A description of the chemicals or flammables that trigger coverage, including locations and amounts.
 - ii. The units or sub-units of the facility that are covered or partially covered.
 - iii. If part of a unit or subunit is excluded from coverage, include a brief description of the parts excluded and the rationale.
- d. A copy of this standard as the technical basis used to establish the extent of PSM coverage and coverage boundaries.
- e. The names and qualifications of the individuals who participated in the determinations. The process shall be carried out by recognized professionals. This will include at least one engineer who is knowledgeable in the chemical processes of the plant.
- f. Documentation of any input from employees or contractors whose work places them in contact with the covered process.