# CalARP 201

## 25th Annual CUPA Conference

## March 20-23, 2023


**Joint Presentation:**
**Alvin Lal - (Stanislaus County)**
**Uriah Donaldson (Resource Compliance)**

# CalARP Applicability - Uriah

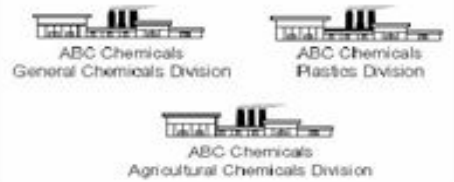
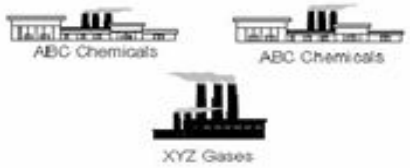
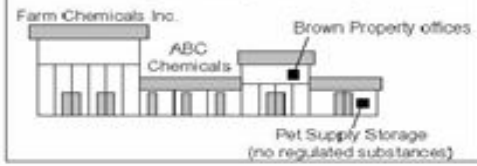
| EPA Federal | OSHA Federal | OSHA State | CUPA State |
|---|---|---|---|
| Risk Management Program | Process Safety Manager | Process Safety Management | California Accidental Release Prevention Program |

# CalARP Applicability

- An owner or operator of a **stationary source** that has more than a threshold quantity of a regulated substance in a **process**, as determined under this RMP and/or CalARP, must comply with the requirements of RMP and/or CalARP

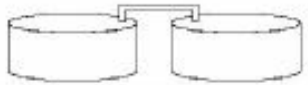
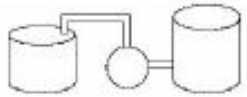
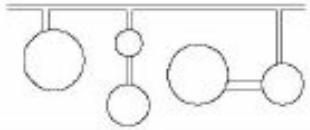
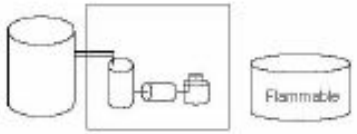
# Definition
# Stationary Source

A **Stationary Source** is a "facility" with more than a threshold quantity of a regulated substance as found in the RMP/CalARP regulations

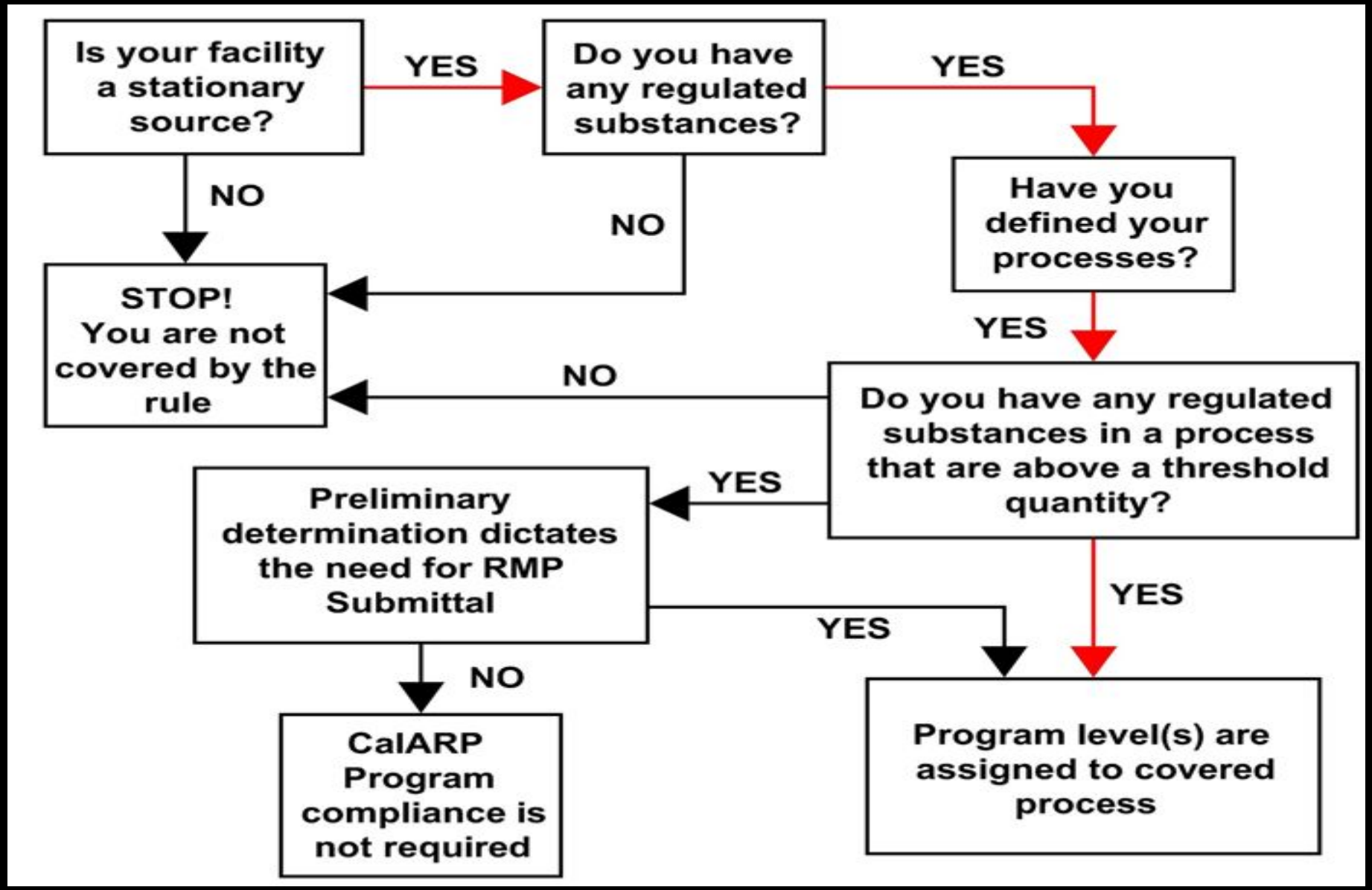
| Schematic Representation | Description | Interpretation |
|---|---|---|
|  | *same* owner<br>*same* industrial group | 1 stationary source<br>1 RMP |
|  | two owners | 2 stationary sources<br>2 RMPs<br>1 ABC<br>1 XYZ |
|  | two owners<br>three industrial groups | 3 Stationary sources<br>3 RMPs<br>1 ABC Chemicals<br>1 ABC Refinery<br>1 XYZ Gases |
|  | two owners | 2 stationary sources<br>2 RMPs |
|  | *same* owner<br>*same* industrial group<br>contiguous property | 1 stationary source<br>1 RMP |
| Building owned by Brown Properties<br>  | two owners | 2 stationary sources<br>2 RMPs<br>1 ABC Chemicals<br>1 Farm Chemicals |

# Definition - Process

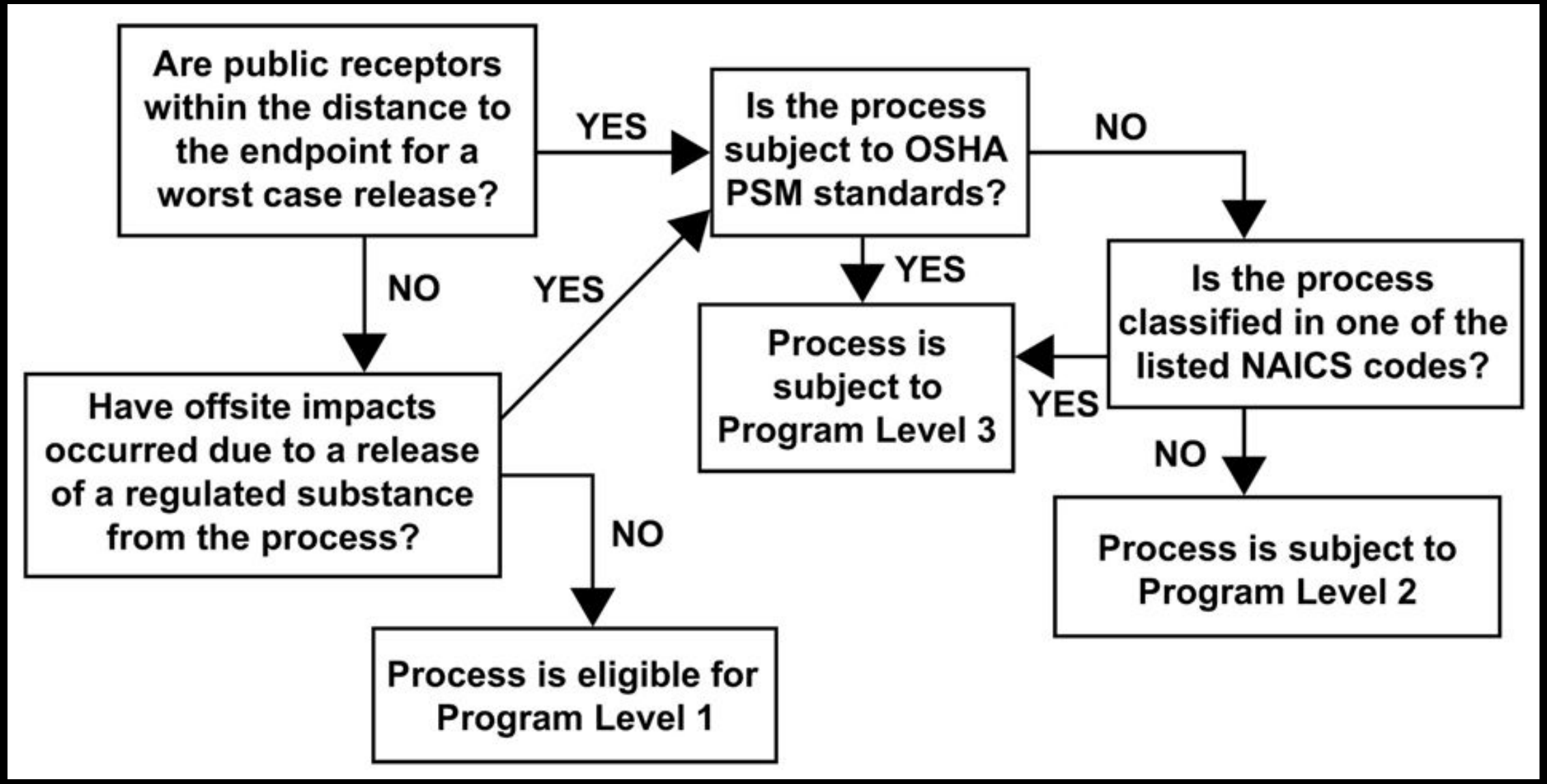
**Process** means any activity involving a regulated substance including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities. For the purposes of this definition, any group of vessels that are interconnected, or separate vessels that are located such that a regulated substance could be involved in a potential release, shall be considered a single process

| Schematic Representation | Description | Interpretation |
|---|---|---|
|  | 1 vessel<br>1 regulated substance above TQ | 1 process |
|  | 2 or more connected vessels<br>*same* regulated substance<br>above TQ | 1 process |
|  | 2 or more connected vessels<br>*different* regulated substances<br>each above TQ | 1 process |
|  | pipeline feeding multiple vessels<br>total above TQ | 1 process |
|  | 2 or more vessels co-located<br>*same* substance<br>total above TQ | 1 process |
|  | 2 or more vessels co-located<br>*different* substances<br>each above TQ | 1 process |
|  | 2 vessels, located so they won't be involved in a single release<br>*same* or *different* substances<br>each above TQ | 2 processes |
|  | 2 locations with regulated substances<br>each above TQ | 1 or 2 processes depending on distance |
|  | 1 series of interconnected vessels<br>*same* or *different* substances above TQs<br>*plus* a co-located storage vessel<br>containing flammables | 1 process |

# Stationary Source



# Stationary Source- Program Level



# CalARP Applicability – Thresholds

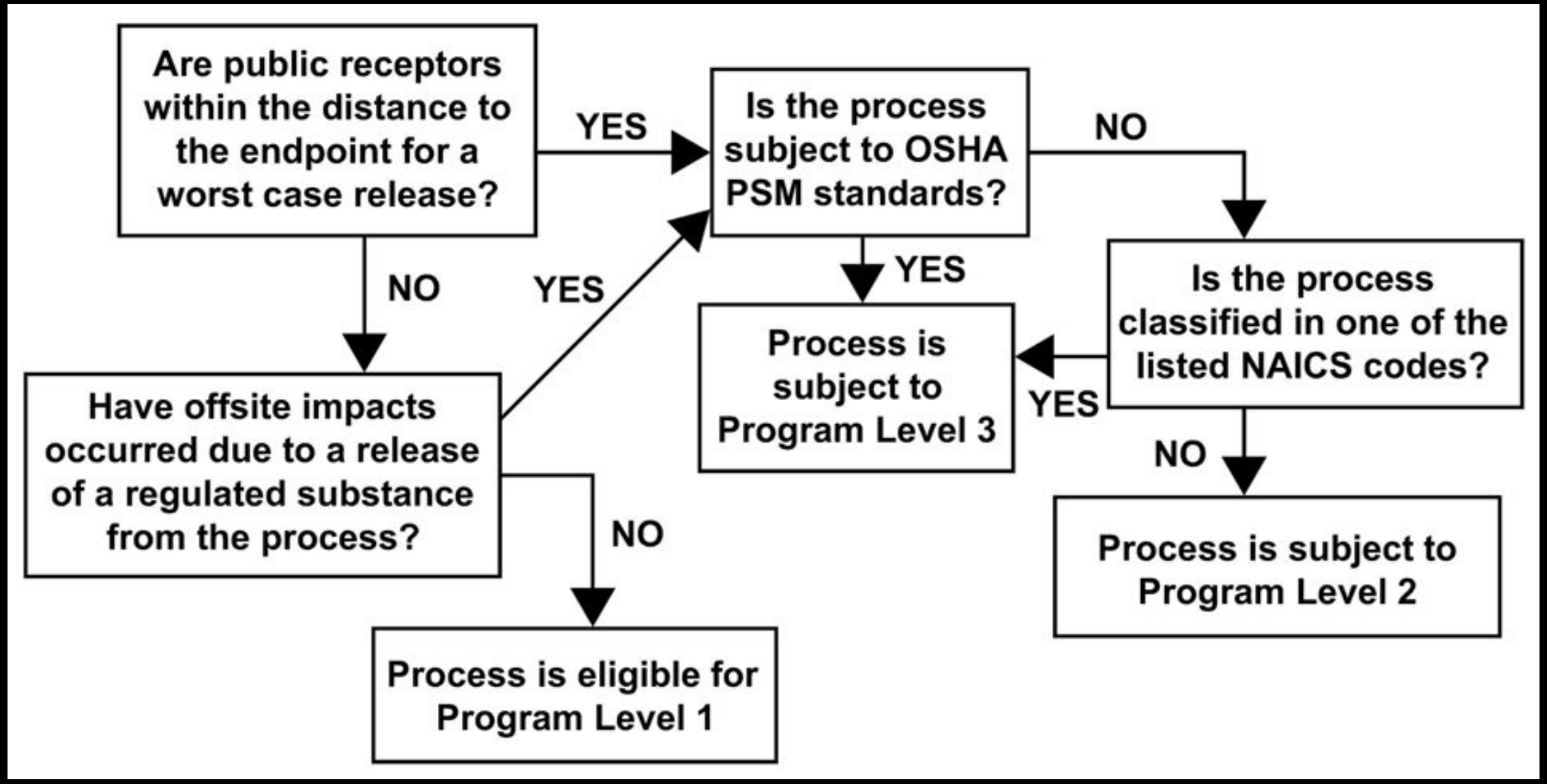
| Chemical Name | Fed RMP Threshold | Fed-OSHA PSM Threshold | CalARP Threshold | Cal-OSHA PSM Threshold |
|---|---|---|---|---|
| Ammonia | 10,000 lbs. | 10,000 lbs. | 500 lbs. | 10,000 lbs. |
| Sulfur Dioxide | 5,000 lbs | 1,000 lbs | 500 lbs. | 1,000 lbs |
| Chlorine | 2,500 lbs. | 1,500 lbs | 100 lbs. | 1,500 lbs |

- Scenario #1 - Ammonia refrigeration facility with 25,000 lbs.
- Scenario #2 - Sulfur Dioxide storage cage with 900 lbs.
- Scenario #3 - Two one-ton containers of Chlorine

# Scenario #1 – Ammonia 25,000 lb. System

| Chemical Name | Fed RMP Threshold | Fed-OSHA PSM Threshold | CalARP Threshold | Cal-OSHA PSM Threshold |
|---|---|---|---|---|
| Ammonia | 10,000 lbs. | 10,000 lbs. | 500 lbs. | 10,000 lbs. |

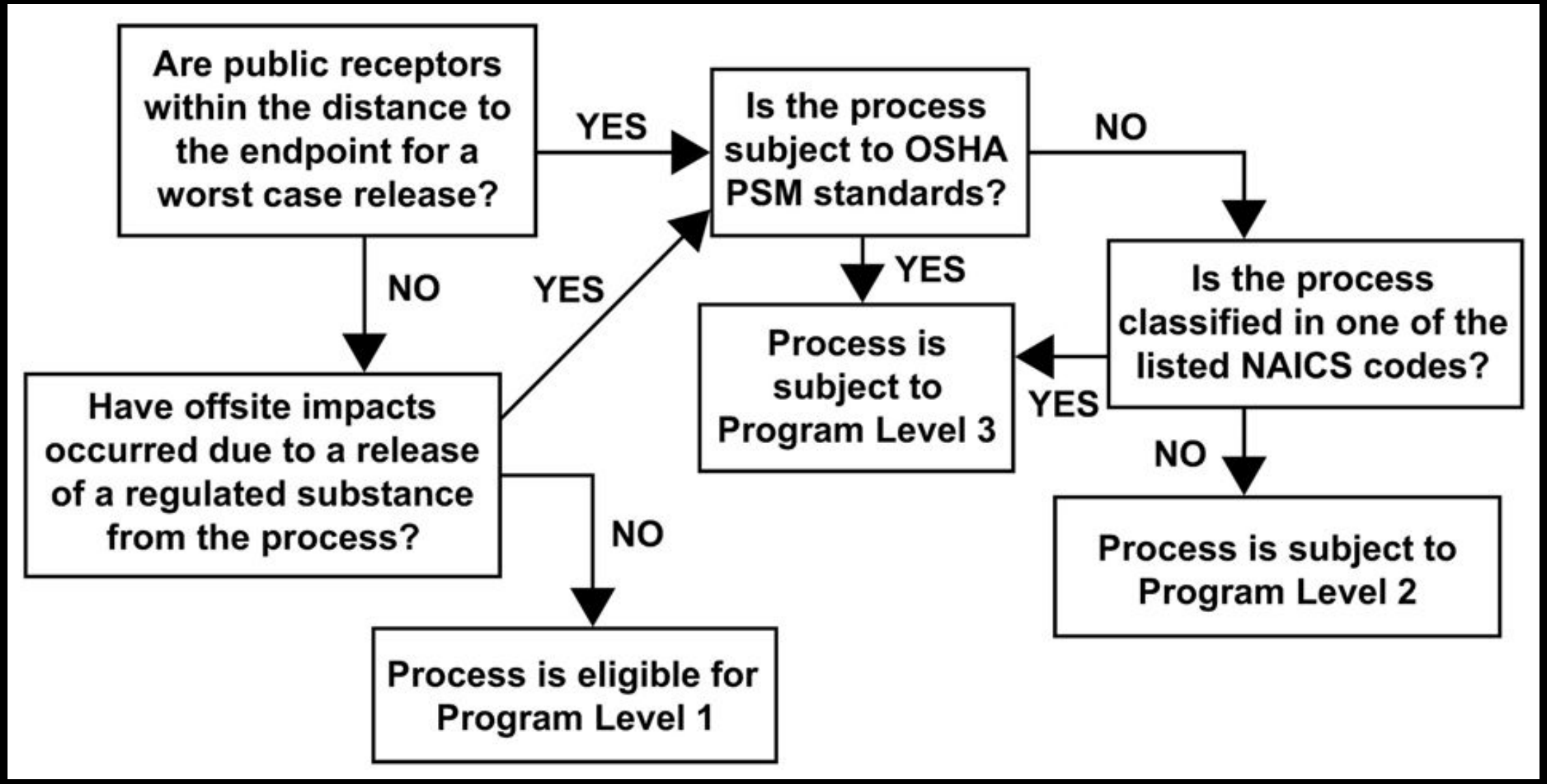
# Stationary Source- Program Level



# Scenario #2 – Sulfur Dioxide 900 lbs.

| Chemical Name | Fed RMP Threshold | Fed-OSHA PSM Threshold | CalARP Threshold | Cal-OSHA PSM Threshold |
|---|---|---|---|---|
| Sulfur Dioxide | 5,000 lbs | 1,000 lbs | 500 lbs. | 1,000 lbs |

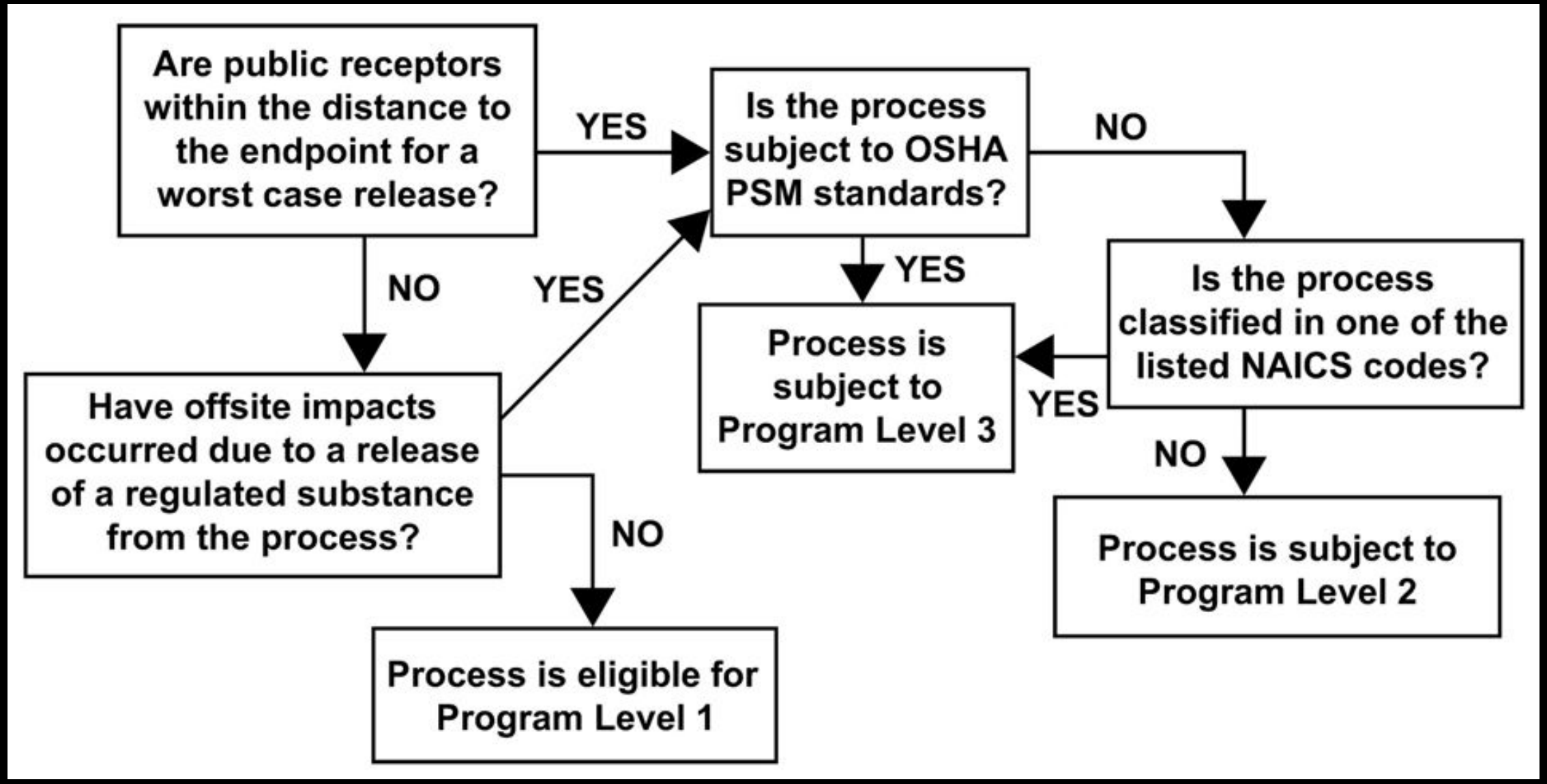
# Stationary Source- Program Level



# Scenario #3 - Chlorine Process – Two one-ton containers

| Chemical Name | Fed RMP Threshold | Fed-OSHA PSM Threshold | CalARP Threshold | Cal-OSHA PSM Threshold |
|---|---|---|---|---|
| Chlorine | 2,500 lbs. | 1,500 lbs | 100 lbs. | 1,500 lbs |

# Stationary Source- Program Level



# Program Elements - Alvin

| Program Requirement Comparison | | |
|---|---|---|
| ***Program 1*** | ***Program 2*** | ***Program 3*** |
| Executive Summary | Executive Summary | Executive Summary |
| Worst-Case Release Scenario | Worst-Case Release Scenario | Worst-Case Release Scenario |
| N/A | Alternative Release Scenario | Alternative Release Scenario |
| 5 Year Accident History | 5 Year Accident History | 5 Year Accident History |
| **Prevention Program Elements** | | |
| N/A | 7 Elements | 12 Elements |
| **Emergency Response Program** | | |
| Coordination | Develop a Program and Coordination | Develop a Program and Coordination |

# Prevention Program Elements

| Program 2 | Program 3 |
|---|---|
| Safety Information | Process Safety Information |
| Hazard Review | Process Hazard Analysis |
| Operating Procedures | Operating Procedures |
| Training | Training |
| Maintenance | Mechanical Integrity |
| Incident Investigation | Incident Investigation |
| Compliance Audit | Compliance Audit |
| | Management of Change |
| | Pre-Startup Safety Review |
| | Contractors |
| | Employee Participation |
| | Hot Work Permits |

# Program Level 2 & 3 Differences

## ***P3: Management of Change - §2760.6***

- P2: Safety information must be updated when a change occurs - §2755.1(c)
- P2: Operating procedures must be updated when a change occurs - §2755.3(c)
- P2: Training is required for all employees - §2755.4

| Program 2 | Program 3 |
|---|---|
| **Safety Information** | Process Safety Information |
| Hazard Review | Process Hazard Analysis |
| **Operating Procedures** | Operating Procedures |
| **Training** | Training |
| Maintenance | Mechanical Integrity |
| Incident Investigation | Incident Investigation |
| Compliance Audit | Compliance Audit |
| | **Management of Change** |
| | Pre-Startup Safety Review |
| | Contractors |
| | Employee Participation |
| | Hot Work Permits |

# Program Level 2 & 3 Differences

***P3: Pre-Startup Review - §2760.7***

- P2: Safety information must be updated when a change occurs - §2755.1(c)
- P2: Training is required for all employees - §2755.4

| Program 2 | Program 3 |
|---|---|
| **Safety Information** | Process Safety Information |
| Hazard Review | Process Hazard Analysis |
| **Operating Procedures** | Operating Procedures |
| Training | Training |
| Maintenance | Mechanical Integrity |
| Incident Investigation | Incident Investigation |
| Compliance Audit | Compliance Audit |
| | Management of Change |
| | **Pre-Startup Safety Review** |
| | Contractors |
| | Employee Participation |
| | Hot Work Permits |

# Program Level 2 & 3 Differences

***P3: Contractors - §2760.12***

- P2: Owner must ensure that every contractor is trained to perform maintenance procedures - §2755.5(c)

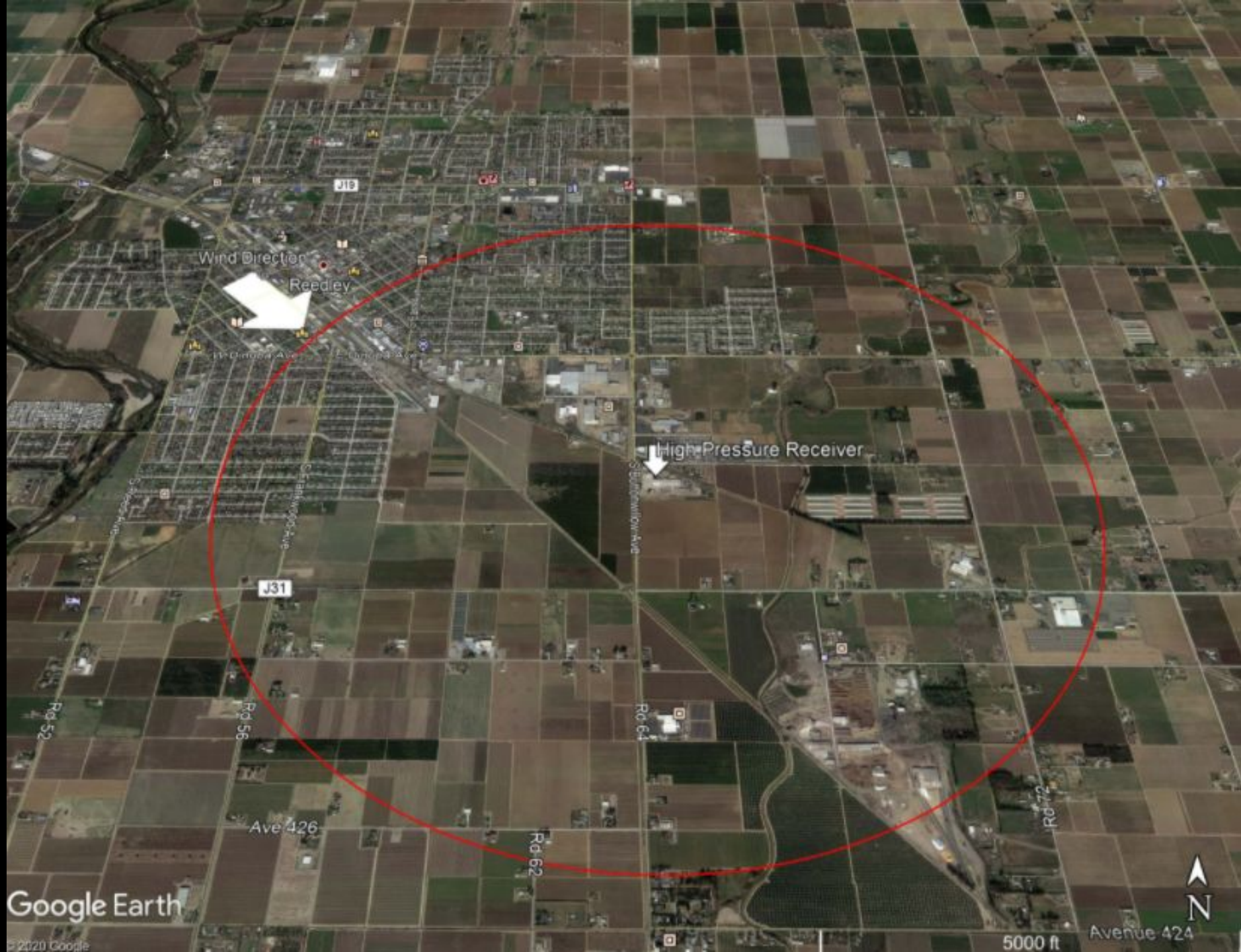
| Program 2 | Program 3 |
|---|---|
| Safety Information | Process Safety Information |
| Hazard Review | Process Hazard Analysis |
| Operating Procedures | Operating Procedures |
| Training | Training |
| **Maintenance** | Mechanical Integrity |
| Incident Investigation | Incident Investigation |
| Compliance Audit | Compliance Audit |
| | Management of Change |
| | Pre-Startup Safety Review |
| | **Contractors** |
| | Employee Participation |
| | Hot Work Permits |

# Program Level 2 & 3 Differences

- No explicit requirement in CalARP Program 2.
- Still required under general OSHA regulations.

| Program 2 | Program 3 |
|---|---|
| Safety Information | Process Safety Information |
| Hazard Review | Process Hazard Analysis |
| Operating Procedures | Operating Procedures |
| Training | Training |
| Maintenance | Mechanical Integrity |
| Incident Investigation | Incident Investigation |
| Compliance Audit | Compliance Audit |
| | Management of Change |
| | Pre-Startup Safety Review |
| | Contractors |
| | Employee Participation |
| | **Hot Work Permits** |

# Hazard Assessment & Offsite Consequence Analysis



# RMP Comp

# ALOHA

EPA United States Environmental Protection Agency

RMP*Comp

## RMP*Comp

Back

### Estimated Distance Calculation

**Estimated distance to toxic endpoint:** 0.2 miles (0.3 kilometers)

This is the downwind distance to the toxic endpoint specified for this regulated substance under the RMP Rule. Report all distances shorter than 0.1 mile as 0.1 mile, and all distances longer than 25 miles as 25 miles.

### Scenario Summary

**Chemical:** Ammonia (anhydrous)
**CAS number:** 7664-41-7
**Threat type:** Toxic Gas
**Scenario type:** Alternative
**Release duration:** 10 minutes
**Release rate:** 57.6 pounds per min
**Mitigation measures:** NONE
**Surrounding terrain type:** Rural surroundings (terrain generally flat and unobstructed)
**Toxic endpoint:** 0.14 mg/L; basis: ERPG-2

**Assumptions about this scenario**

**Wind speed:** 3 meters/second (6.7 miles/hour)
**Stability class:** D
**Air temperature:** 77 degrees F (25 degrees C)

Text Summary ALOHA® 5.4.7

```
SITE DATA:
  Location: EASTSIDE PACKING, CALIFORNIA
  Building Air Exchanges Per Hour: 0.57 (unsheltered single storied)
  Time: May 1, 2020  0800 hours PDT (user specified)

CHEMICAL DATA:
  Chemical Name: AMMONIA
  CAS Number: 7664-41-7                    Molecular Weight: 17.03 g/mol
  AEGL-1 (60 min): 30 ppm   AEGL-2 (60 min): 160 ppm   AEGL-3 (60 min): 1100 ppm
  IDLH: 300 ppm      LEL: 150000 ppm      UEL: 280000 ppm
  Ambient Boiling Point: -28.6° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 2.25 meters/second from nw at 3 meters
  Ground Roughness: open country           Cloud Cover: 3 tenths
  Air Temperature: 86° F                   Stability Class: C
  No Inversion Height                      Relative Humidity: 25%

SOURCE STRENGTH:
  Direct Source: 286 pounds/min            Source Height: 0
  Release Duration: 7 minutes
  Release Rate: 286 pounds/min
  Total Amount Released: 2,002 pounds
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE:
  Model Run: Gaussian
  Red    : 239 yards --- (1100 ppm = AEGL-3 [60 min])
  Orange: 642 yards --- (160 ppm = AEGL-2 [60 min])
  Yellow: 1566 yards --- (30 ppm = AEGL-1 [60 min])
```

# Hazard Assessment & Offsite Consequence Analysis

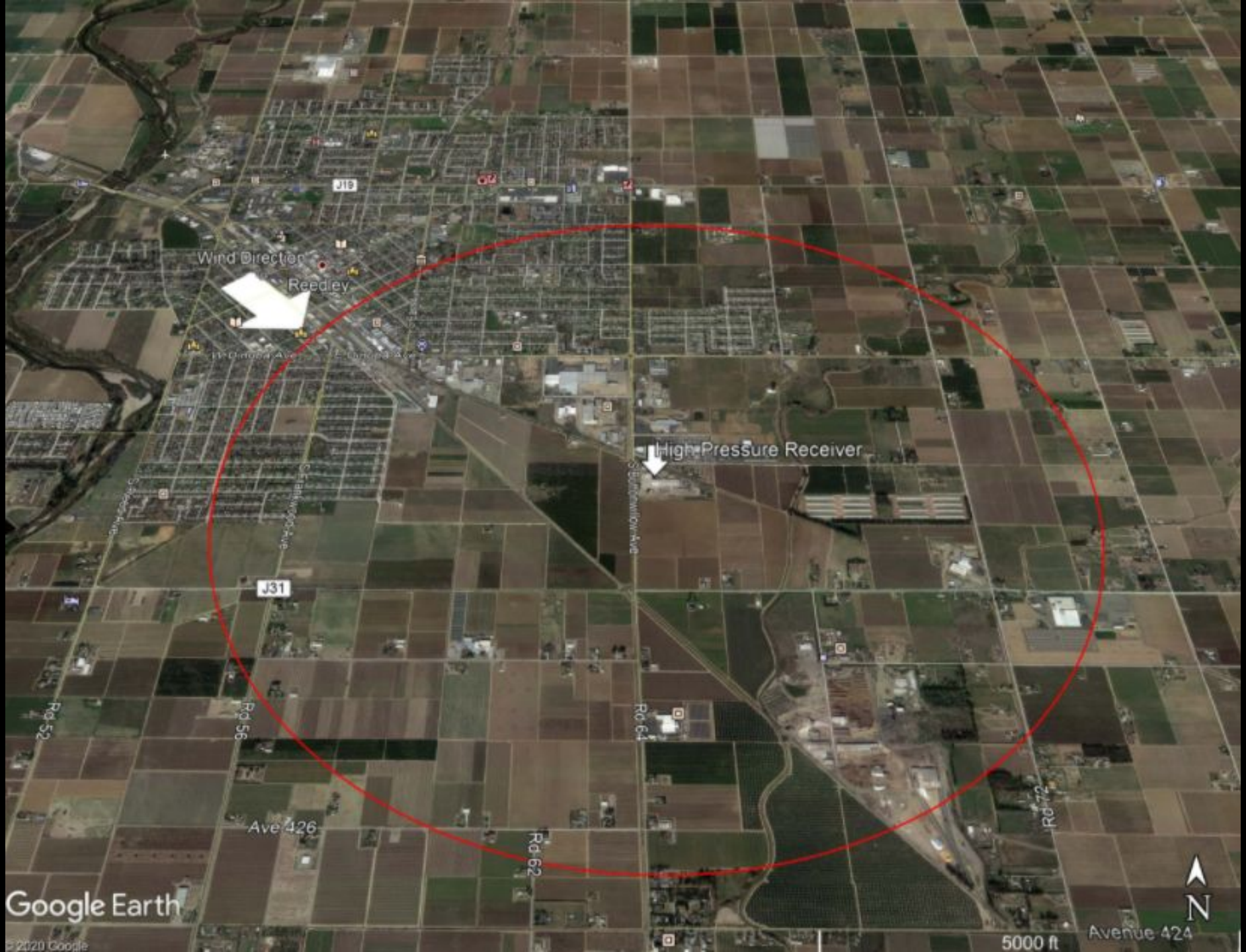
**Applicability**

- Program 1 processes must perform a worst-case release scenario and five-year accident history (§2750.3 and §2750.9)
- Program 2-4 processes must comply with all Hazard Assessment requirements (§2750.1-§2750.9)

# Hazard Assessment & Offsite Consequence Analysis

**Worst-Case Release Scenario**

- A hypothetical analysis of a worst-case accidental release and its effects on life, property, and the environment.
- Used to determine the appropriate program level of a process based on the impact to public receptors.
- Defined as the largest quantity of a regulated substance release from a vessel or pipe that results in the greatest distance to an ***endpoint***.


Wind Direction
Reedley
High Pressure Receiver
J18
J31
Ave 426
Rd 52
Rd 56
Rd 62
Rd 64
Rd 72
Avenue 424
5000 ft
N
Google Earth
© 2020 Google

# Hazard Assessment & Offsite Consequence Analysis

**Offsite Consequence Analysis Parameters [§2750.2]**

- Endpoints [§2750.2(a)]
- Wind Speed [§2750.2(b)]
- Ambient Temperature / Humidity [§2750.2(c)]
- Height of Release [§2750.2(d)]
- Surface Roughness [§2750.2(e)]

**WC Release Scenario – Toxic Gases [§2750.3(c)]**

- Toxic substances that are normally gases
  - Assume the entire quantity is released over 10 minutes
  - The release rate is the quantity (lbs) divided by 10 minutes unless passive mitigation systems are in place

# Hazard Assessment & Offsite Consequence Analysis

**Alternative Release Scenario Analysis [§2750.4]**

- Must identify and analyze at least one alternative release scenario for each substance in a covered process
- Scenarios shall:
  - (1) Be more likely than WC (2) Reach an endpoint offsite unless no such scenario exists (3) Reach a public receptor, unless no such scenario exists
- Scenarios to consider:
  - Transfer hose, Piping release, Vessel or pump release, Vessel overfilling and spill, Shipping container mishandling

# Hazard Assessment & Offsite Consequence Analysis

**Population Impacts [§2750.5]**

- Estimate the population within a circle with its center at the point of the release and a radius determined by the distance to the endpoint
- Population must include:
  - (1) Residential population (2) Institutions (schools, hospitals, long term health care facilities, child day care facilities, prisons) (3) Parks (4) Recreational areas (5) Major commercial, office, and industrial buildings
- Use most recent census data
- Estimate population to two significant digits

# Hazard Assessment & Offsite Consequence Analysis

**OCA Review and Update [§2750.7]**

- Document the review of the OCA at least once every five (5) years
- If a change occurs that increases or decreases the distance to the endpoint by a factor of two or more, a revised analysis must be performed and a corrected RMP submitted within six (6) months

# Process Hazard Analysis - Alvin

**Methodologies**

- What-If Checklists
- HAZOP

# What-If Checklist Example

## PHA Checklist

### 1: High Pressure Receiver

| What If | Scenarios | Consequences | Severity | Likelihood | Risk Rankings | Safeguards |
|---|---|---|---|---|---|---|
| 1: What if the equipment or associated components is damaged by nearby activity? (ANSI/IIAR 2-2014 §5.17.1) | The purge valve on the bottom of the bull's-eye column is broken off when someone steps on it. | 1. Death<br>2. High pressure liquid ammonia release<br>3. Injury<br>4. Reactive maintenance | 4 | 1 | C | 1. Each of the valves on the high pressure receivers is adequately protected from inadvertent impact.<br><br>2. Gibson Wine Company personnel (including forklift drivers) have been trained to take extra care when working around the refrigeration equipment and other utilities equipment (e.g. electrical transformers). |

# HAZOP Example

## PHA Checklist

### 1: High Pressure Receiver

| Parameter & Guide Word | Scenarios | Consequences | Severity | Likelihood | Risk Rankings | Safeguards |
|---|---|---|---|---|---|---|
| Corrosion - More | An inadequate maintenance program allows the vessel to become excessively corroded. | 1. High pressure liquid ammonia release<br>2. Equipment damage | 4 | 1 | C | 1. All carbon steel pipes and vessels will be painted to help prevent corrosion from occurring.<br><br>2. Grapery has developed and will implement a mechanical integrity program as required by RMP, PSM, and CalARP. |

# Process Hazard Analysis – Team

| Engineering | Methodology |
| --- | --- |
| • Professional Engineer (P.E.)<br>• Engineering Degree from a recognized institution<br>• Has received on the job training in relevant areas of engineering concepts and functioning in a role which demonstrates his/her engineering expertise. | Whoever is leading the PHA must be competent in the methodology being used. For example, just because an individual has led a PHA using the What-If methodology, does not mean that individual is competent in the HAZOP methodology. |
| **Operations** | **Process Specific Knowledge** |
| Someone who understand the operations of the process being evaluated. This includes things such as procedures, hours of operations, authorized personnel etc. | There must be at least one person present who understands how the process works. This requirement may be fulfilled by a contractor, engineer on staff, or other personnel. Example: If a refrigeration system is being evaluated, there must be someone present who understands the principles of refrigeration and how the various components function and interconnect. |

## *3.1 Process Hazard Analysis Team*

The *PHA* team was composed of the following team members:

| First Name | Last Name | Title | Company | Expertise |
|---|---|---|---|---|
| Peter | Thomas | PHA Team Leader, Licensed Mechanical Engineer | Resource Compliance, Inc. | Engineering, PHA Leadership, Process Safety Management |
| Albert | Herrera | Service Technician | California Controlled Atmosphere | Refrigeration Service |
| Gustavo | Gomez | Environmental Health Specialist | Fresno County Environmental Health | CalARP, Environmental Health |
| [redacted] | [redacted] | Supervisor | [redacted] | Process Operations |
| [redacted] | [redacted] | General Manager | [redacted] | Process Operations, Management |
| [redacted] | [redacted] | Compliance | [redacted] | Process Operations, Compliance |

The *PHA* leader was Peter Thomas, P.E., the President and Senior Engineer at Resource Compliance. Peter has extensive knowledge of chemical safety regulation with particular emphasis on ammonia refrigeration and process safety management. He has a degree in mechanical engineering from California Polytechnic State University San Luis Obispo and is a licensed professional engineer.

# Process Hazard Analysis

**Content**

- Hazards of Process
- Controls - Engineering and Administrative
- Consequences of Failure of controls including safe operating limits
- Stationary source Siting
- Human Factors
- Qualitative evaluation of health and safety effects of failure of controls
- External Events (Seismic)

# Process Hazard Analysis

**Report & Findings**

- Recommendations and status communicated with Management System
- Verify a written schedule to address findings and recommendations
- 2.5 Years to complete or as per agreed by the local agency

# Mechanical Integrity - Alvin

**Inspection**

- Daily, Monthly, Annual

**Testing**

- Detection Systems
- Compressor Safeties
- Vibration Analysis

**Maintenance**

- Changing / Draining Oil
- Painting

# RMP Registration, Submission, Correction, Updates

**Registration [§ 2740.1]**

- Includes basic registration type information such as:
  - Name and Address, Emergency Contact Info, Name of Regulated Substance, Number of Full Time Employees etc.

**Submission [§ 2745.1]**

- RMP information required by the USEPA shall be submitted to both the USEPA and CUPA no later than the date on which a regulated substance is first present in a process above a threshold quantity

## Section 1. Registration Information

| | |
|---|---|
| **Reason for Resubmission** | 5-year update (40 CFR 68.190(b)(1)) |
| **1.1 Source Identification** | |
| **1.1.a. Facility Name** | Eastside Packing, Inc. |
| **1.1.b. Parent Company #1 Name** | |
| **1.1.c. Parent Company #2 Name** | |
| **1.2 EPA Facility Identifier** | 100000131154 |
| **1.3 Other EPA Systems Facility Identifier** | |
| **1.4 Dun and Bradstreet Numbers (DUNS)** | |
| **1.4.a. Facility DUNS** | |
| **1.4.b. Parent Company #1 DUNS** | |
| **1.4.c. Parent Company #2 DUNS** | |
| **1.5 Facility Location** | |
| **1.5.a. Street - Line 1** | 1750 S. Buttonwillow |
| **1.5.b. Street - Line 2** | |
| **1.5.c. City** | Reedley |
| **1.5.d. State** | CA |
| **1.5.e. Zip Code - Zip +4 Code** | 93654 |
| **1.5.f. County** | FRESNO |
| **1.5.g. Facility Latitude (in decimal degrees)** | 36.581507 |
| **1.5.h. Facility Longitude (in decimal degrees)** | -119.429626 |
| **1.5.i. Method for determining Lat/Long** | Interpolation - Photo |
| **1.5.j. Description of location identified by Lat/Long** | Process Unit |
| **1.5.k. Horizontal Accuracy Measure (meters)** | 25 |
| **1.5.l. Horizontal Reference Datum Code** | North American Datum of 1983 |
| **1.5.m. Source Map Scale Number** | 24000 |
| **1.6 Owner or Operator** | |
| **1.6.a. Name** | Eastside Packing, Inc. |
| **1.6.b. Phone** | (559) 638-6700 |
| **1.6.c. Street - Line 1** | 1750 S. Buttonwillow |
| **1.6.d. Street - Line 2** | |
| **1.6.e. City** | Reedley |
| **1.6.f. State** | CA |
| **1.6.g. Zip Code - Zip +4 Code** | 93654 |
| **Foreign Country** | |
| **Foreign State/Province** | |
| **Foreign Zip/Postal Code** | |
| **1.7 Name, title and email address of person or position responsible for RMP (part 68) implementation** | |

# RMP Registration, Submission, Correction, Updates

**RMP Updates [§ 2745.10]**

- At least once every five (5) years
- New regulated substance (No later than date first present above threshold)
- Change that requires a revised offsite consequence analysis (6 Months)
- Change that alters the Program level (6 Months)

**RMP Corrections [§ 2745.10.5]**

- New Accident History Information (6 Months)
- New Emergency Contact (30 Days)

# Process Safety Information - Uriah

| PSI Elements | |
|---|---|
| 1) Safety Data Sheets | 8) Electrical Classifications |
| 2) Block Flow Diagram | 9) Relief System Design |
| 3) Process Chemistry | 10) Ventilation System Design |
| 4) Max Intended Inventory | 11) Design Codes and Standards |
| 5) Operating Limits and Consequences of Deviation | 12) Material & Energy Balances |
| 6) Materials of Construction | 13) Safety Systems |
| 7) Piping and Instrumentation Diagrams (P&IDs) | |

# Process Safety Information

**Maximum Intended Inventory**

- How is this calculated?
- Delivery Receipts
- Full Pump Down
- Engineering based calculation

Room: **High Pressure Receiver**

**System Parameters:**

| | | |
|---|---|---|
| System Capacity = | 200 | TR |
| System Charge = | 27000 | lbs |
| Condensing Temp.= | 90 | °F |
| Liquid Temp.= | 90 | °F |
| Max. Op. Pressure = | 250 | psig |

| | | |
|---|---|---|
| Min. Liquid Height (h) = | 4 | in. |
| Number of Receivers = | 1 | |
| O.D. (chosen) = | 78 | in |
| O.A.L. (chosen) = | 30 | ft |

**Note:** When the system is completely pumped down during the off-season the level in the receiver is approximately 59" or 80% full. The inventory analysis has been performed based on that assumption.

| | | |
|---|---|---|
| True liquid Level Inside= | 3.19 | in |
| Inside Diameter | 76.38 | in |
| Liquid Pump Down Area (act.) = | 31.36 | ft² |
| Length (100% Vol. @ 85% Full) = | 27.3 | ft |

Vessel Description:

| | | |
|---|---|---|
| Diameter = | 78 | in. |
| Overall Length = | 30 | ft. |
| Shell Length = | 26.33 | ft |
| Head Volume = | 36.60 | cu. ft. |
| Vessel Vol. = | 911.0 | cu. ft. |
| | 6814 | gal |
| Ext. Surface Area = | 679.0 | ft² |
| $NH_3$ Charge @ (h) = | 505 | lbs |
| $NH_3$ Charge @ 80% = | **26995** | lbs |
| % System Charge = | **100%** | |
| $NH_3$ Charge @ 100% = | 33744 | lbs |

| Percent of Volume | Level in Inches | Total Volume of Liq in cu ft | Total Mass of Liq in lbm |
|---|---|---|---|
| 95% | 71.22 | 865.46 | 32056.79 |
| 90% | 66.61 | 819.91 | 30369.59 |
| 85% | 62.63 | 774.36 | 28682.39 |
| 80% | 58.99 | 728.81 | 26995.19 |
| 75% | 56.24 | 683.26 | 25307.99 |
| 70% | 52.28 | 637.71 | 23620.79 |
| 65% | 49.09 | 592.16 | 21933.59 |
| 60% | 43.67 | 546.61 | 20246.39 |
| 55% | 42.88 | 501.06 | 18559.19 |

**Accumulator(s):**

| Name | Orientation | Qty | O.D. (in) | Wall Thickness (in) | Length (ft) | Level (in) | Charge (lbs) |
|---|---|---|---|---|---|---|---|
| MSA | Horizontal | 1 | 36 | 0.25 | 9.67 | 4 | 165 |
| FA | Horizontal | 3 | 24 | 0.375 | 6 | 4 | 244 |
| FA | Horizontal | 2 | 30 | 0.25 | 6 | 4 | 186 |
| FA | Horizontal | 2 | 30 | 0.25 | 8 | 4 | 248 |
| FA | Horizontal | 1 | 20 | 0.375 | 6 | 4 | 73 |
| FA | Horizontal | 1 | 24 | 0.375 | 8 | 4 | 109 |
| | | | | - | | | 0 |
| | | | | - | | | 0 |

Subtotal
**1,025**

**Receiver(s):**

| Name | Orientation | Qty | O.D. (in) | Wall Thickness (in) | Length (ft) | Level (in) | Charge (lbs) |
|---|---|---|---|---|---|---|---|
| HPR | Horizontal | 1 | 42 | 0.437 | 20 | 10 | 1,285 |
| | | | | - | | | 0 |
| | | | | - | | | 0 |
| | | | | - | | | 0 |

Subtotal
**1,285**

**Total System Charge:** **10,936** **lbs**

# Process Safety Information

**Upper / Lower Limits & Consequences of Deviation**

- How is this documented?
- The CalARP regulation requires this information to be incorporated into the SOPs (Section 2760.1(c)(1)(D) & (E): 2760.3 (a)(2) (A)& (B)
- Does it count if this information is in the manufacturer's manuals and the SOPs simply reference the manual?
- What is the intent of this regulations?

# Process Safety Information

**Materials of Construction**

- U1A forms for pressure vessels and heat exchanges e.g. plate and frame / chiller units
- Specification sheets for coils and condensers
- Equipment Manuals: pump, compressors, all valves
- Piping Specifications ASTM A 53 & ASME B 31

# FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
## (Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)
## As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Keystone Oilfield Fabrication LLC. 1870 F.M. 407 Rhome, Texas 76078.
(Name and address of Manufacturer)

2. Manufactured for California Controlled Atomsphere 39138 Rd.56 Dinuba, CA 93618
(Name and address of Purchaser)

3. Location of installation Unknown
(Name and address)

4. Type

| HORIZONTAL | 97015-6-001 | N/A | 97015-6 Rev 0 | 14 | 2017 |
|---|---|---|---|---|---|
| (Horizontal or vertical, tank) | (Manufacturer's serial number) | (CRN) | (Drawing number) | (National Board number) | (Year built) |

5. ASME Code, Section VIII, Div. 1

| 2015 | N/A | NONE |
|---|---|---|
| [Edition and Addenda, if applicable (date)] | (Code Case number) | [Special service per UG-120(d)] |

6. Shell

| SA53 GR B ERW | .375" | 0 | 19.25" | 57" |
|---|---|---|---|---|
| (Material spec. number, grade) | (Nominal thickness) | (Corr. allow.) | (Inner diameter) | [Length (overall)] |

**Body Flanges on Shells**

BY JOHNSON CONTROLS

## Submittal Data Form

12-20-2012

**Sold To :**
**JOHNSON CONTROLS/FRICK**
JCI Waynesboro
PO Box 2023
Milwaukee, WI 53201-2024
United States

**Project:**
**Purchase Order No:** WILL ADVISE
**Order #** U134840201
**Frick Order #** 300601800

**All Information is per Unit**

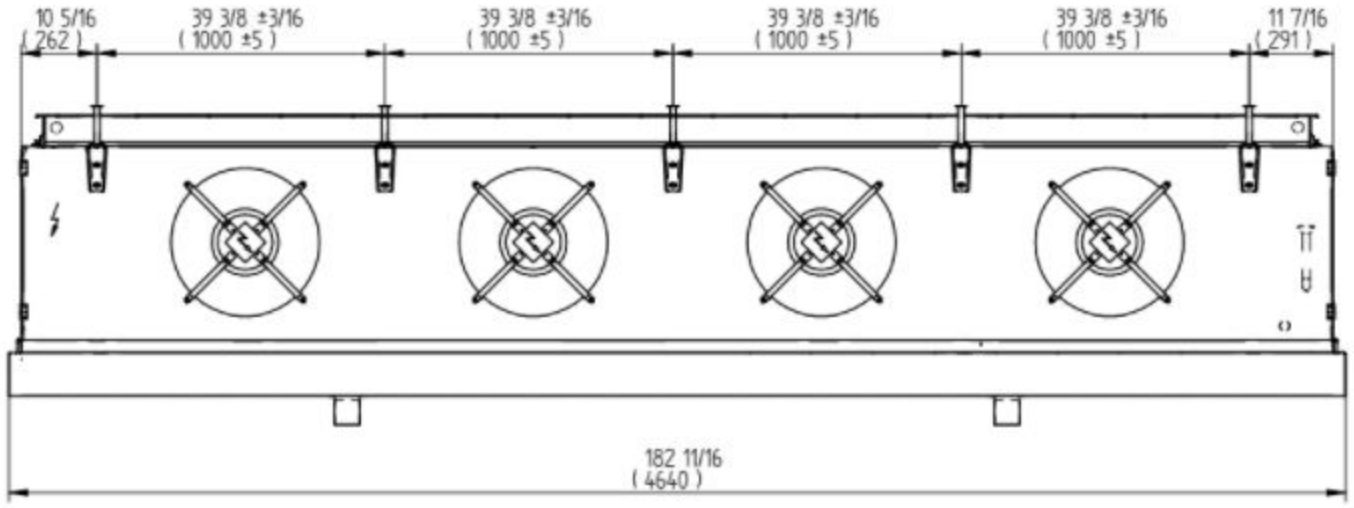
**Quantity: 1 Model XLP2-1018-622 EVAPORATIVE CONDENSER**

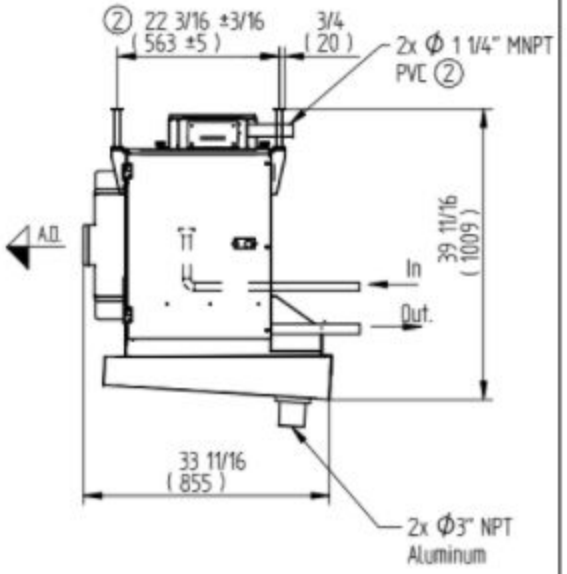
Certified Capacity: 4903.20 MBH based on 90.00°F condensing temp. with an entering air wet bulb of 75.00°F. Refrigerant: R-717.

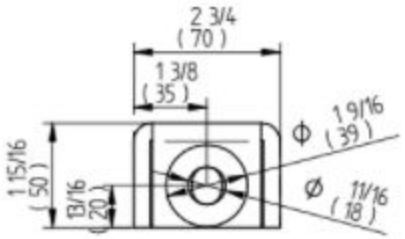
Fan Motor(s): Three (3) 7.5 HP fan motor(s): Totally Enclosed, Fan Cooled (TEFC), 1 Speed/1 Winding - Premium Efficiency (Inverter Duty), suitable for 460 volt, 3 phase, 60 hertz electrical service. Drives are based on 0 inches ESP.

NOTE: Inverter Duty fan motors, furnished in accordance with NEMA Standard Mg.1 -- Part 31, are required for applications using variable frequency drives for fan motor control.

Pump(s): One (1) 7.5 HP pump motor: 1 Speed/1 Winding, suitable for 460 volt, 3 phase, 60 hertz.




-Hanger detail with extension

IT ONLY APPLIES
FOR THIS PROJECT 511384
REV: 02
RELEASED: 12/05/2015
DATE: 12/05/2015
Only for Guntner production

| Performance Data | | Physical Data | |
|---|---|---|---|
| Capacity (Btu/h) | :111,598 | Coil | :F/8/14/7.00/4000/A/V/V |
| Temp. Room | :32.0 °F | Surface area | :1,736 ft² |
| R.H. | :80% | Coil volume | :1.708 ft³ |
| ΔT | :10.0°F | Rows deep | :8 |
| Refrigerant | :NH3 (R717) | Dry Weight / Op. Weight | :712 lb / 789 lb |
| Superheating | :8.0°F | Connection side | :1x Left in air direction |
| Air Flow | :15,250 cfm | Defrost | :Water |
| Air pressure | :14.692 psi | Inlet Ø | :3/4" NPS |

Reference #: 300850305 / Cal CA

Project: Bidart

Notes:
-S= Special casing
-S= Ammonia DX,
-Coil, Water Defrost
-Double tray with 13/16 in insulation
-Gallons per minute for water defrost distribution tray system 22.6 gpm
-Water Distribution To Be PVC Material ②

| | | | | | |
|---|---|---|---|---|---|
| Guentner U.S. Ref.#: 204024 | Dimensions in inches (mm) | | scale | 1:18.18 | paper size DIN A3 |
| | | | material | | |
| | | | weight [kg] | | |
| | | | notice | | |

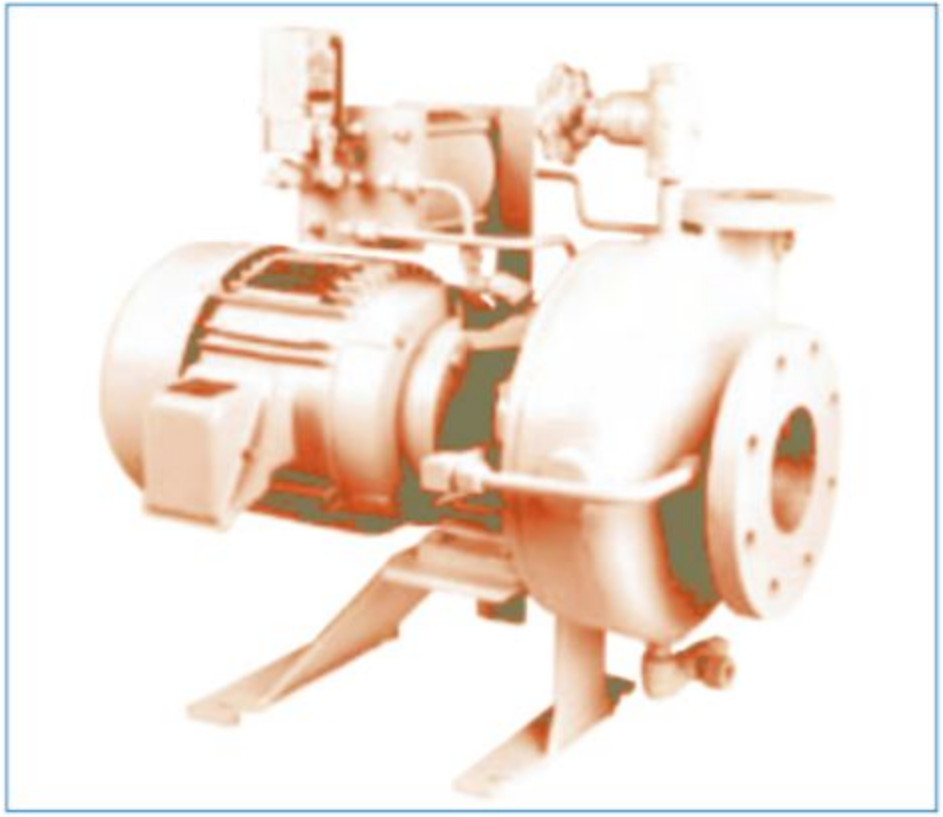
PRODUCT DATA SHEET

# CORNELL PUMP COMPANY

## Refrigerant Pump 2CB

### PUMP SPECIFICATION

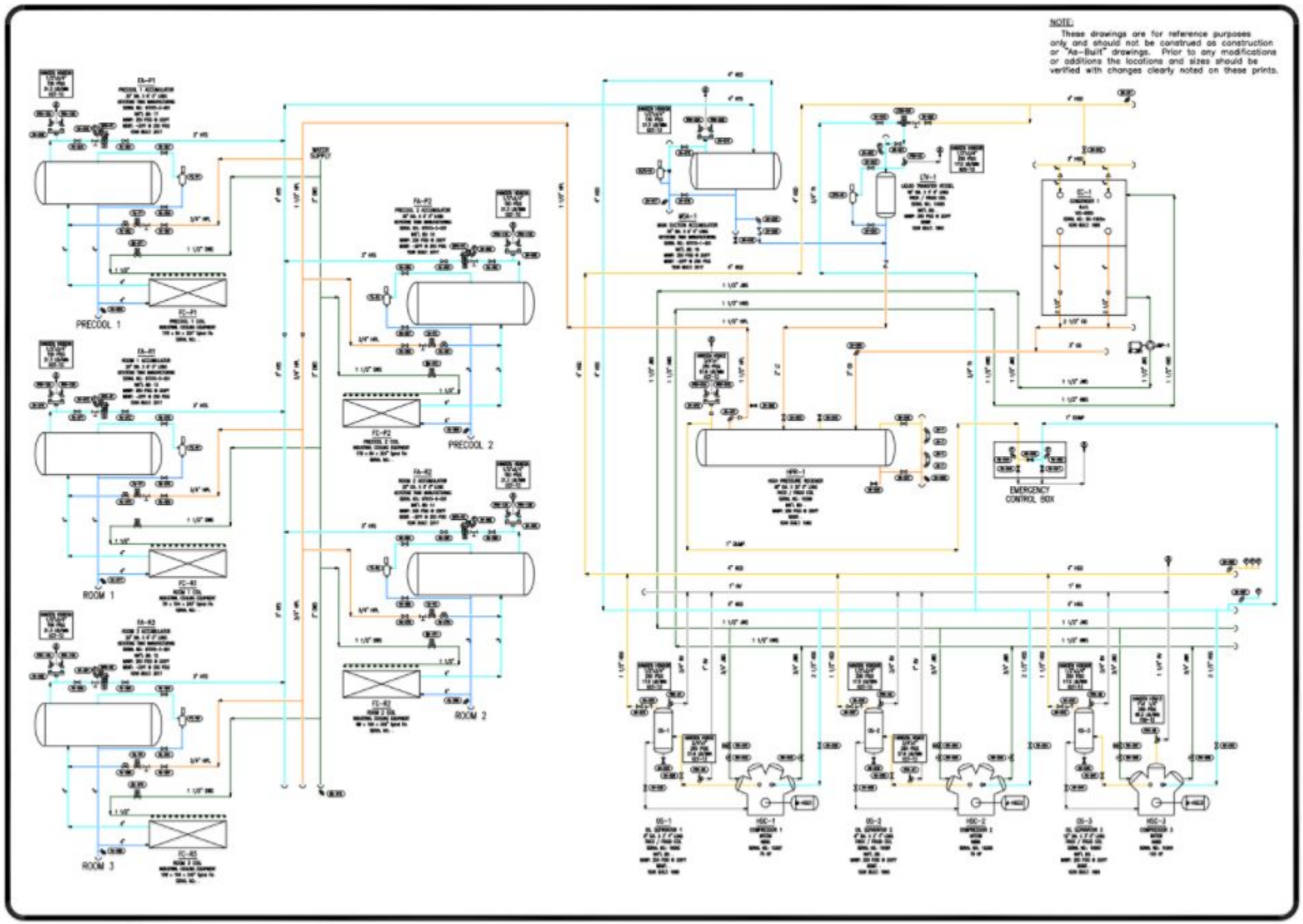
- 2CB Close coupled refrigerant pump
- 4" x 2" Class 150 Flanged suction & discharge
- Constructed of ASTM A536 60-40-18 Ductile Iron
- Industry leading two year warranty
- Four pole (1800/1500RPM) operating speed
- Optional mounting configurations available
- Polar white
- **Mechanical Seal:**
  John Crane, 1.25", T-1, double mechanical shaft seal with pressurized barrier fluid lubrication system, low oil limit switch, and seal chamber heater to maintain proper barrier oil viscosity
- **Motor Specification:**
  Close coupled to a totally enclosed fan cooled, refrigerant atmosphere, hostile environment, premium efficiency motor, with class "F" installation; suitable for VFD applications



# Process Safety Information

**Piping and Instrumentation Diagrams**

- IIAR Ammonia Refrigeration Piping Handbook, Appendix A "Guidelines for Preparation of Ammonia Refrigeration Diagrams"




REVISIONS

RESOURCE COMPLIANCE

VZ Cold Storage

1100 Elmwood
Bakers, CA 93215

PIPING & INSTRUMENTATION DIAGRAM

FACILITY

J. SURTHER

S. DONALDSON

8/30/2017

NONE

DRAWING LOAD

P&ID-1

# Process Safety Information

## Electrical Classifications

[NFPA 70-2017 §500.5(A) General]

- Refrigerant machinery rooms that contain ammonia refrigeration systems and are equipped with adequate mechanical ventilation that *operates continuously* or is *initiated by a detection system* at a concentration not exceeding **150 ppm** shall be permitted to be classified as "unclassified" locations.

[ANSI/IIAR 2-2021 §6.8.1]

- A machinery room not provided with emergency ventilation that is either operated continuously or activated by ammonia detector shall be designated as not less than a Class I, Division 2, Group D Hazardous (Classified) Location, and electrical equipment installed in the machinery room shall be designed to meet this requirement.
-

# Process Safety Information

**Relief System Design & Design Basis**

[ANSI/IIAR 2-2021 §15.3.1.1]

- Pressure vessels and equipment built and stamped in accordance with ASME B&PVC, Section VIII, Division I (2017), shall be provided with pressure relief protection in accordance with ASME B&PVC, Section VIII, Division 1.

# Process Safety Information

**Relief System Design & Design Basis**

Relief Valve Sizing

$$C = f \times D \times L$$

***Where:***

*C= minimum required discharge capacity of the relief device in pounds of air per minute*

*D= outside diameter of the vessel in feet*

*L = outside length of the vessel in feet*

*F = factor depending upon kind of refrigerant*

*Ammonia: f = .05*

| Vessel Name | PRV Setting | Minimum Required Discharge | Pressure Relief Valve Selected | Relief Size | Relief Valve Capacity | Type of Assembly | No. of Assemblies | Total Capacity | Date PRV Installed |
|---|---|---|---|---|---|---|---|---|---|
| | *psig* | *lb/min* | | | *lb/min* | *S/D* | | *lb/min* | |
| High Pressure Receiver 1 | 250 | 72.0 | R/S SRH1 | 1/2" x 3/4" | 56.1 | D | 1 | 56.1 | Apr-12 |
| High Pressure Receiver 2 | 250 | 54.0 | Hansen H5602 | 3/4" x 1" | 57.6 | D | 1 | 57.6 | Nov-13 |
| Liquid Transfer Vessel | 250 | 3.3 | R/S SRH1 | 1/2" x 3/4" | 56.1 | D | 1 | 56.1 | Apr-12 |
| Main Suction Accumulator | 150 | 20.0 | R/S SRH1 | 1/2" x 3/4" | 34.8 | D | 1 | 34.8 | Apr-12 |
| Oil Separator 1 | | 5.6 | See other sheet | N/A | N/A | | | N/A | |
| Oil Separator 2 | | 5.6 | See other sheet | N/A | N/A | | | N/A | |
| Oil Separator 3 | | 8.9 | See other sheet | N/A | N/A | | | N/A | |
| Oil Separator 4 | | 7.1 | See other sheet | N/A | N/A | | | N/A | |
| Precool 1 Accumulator | 150 | 15.0 | R/S SRH1 | 1/2" x 3/4" | 34.8 | D | 1 | 34.8 | Apr-12 |
| Precool 2 Accumulator | 150 | 15.0 | R/S SRH1 | 1/2" x 3/4" | 34.8 | D | 1 | 34.8 | Apr-12 |

# Process Safety Information

**Ventilation System Design**

[ANSI/IIAR 2 1974-1978 §4.3]

- "The room shall be provided with an independent mechanical ventilation system actuated automatically by vapor detector(s)…."

[ANSI/IIAR 2-2021]

- Discharge Upward
- 30 Air Changes / hr &  2,500 fpm
- Powered Independently with emergency control switch
- Interlocked with $NH_3$ Detection - Activated at 150 PPM

# Process Safety Information

**Design Codes and Standards Employed**

- Design codes and standards are the basis for how the system should be built and operated
- Who is verifying design codes and standards?
- Ensure that current design codes and standards are employed during new construction
- Best place to start enforcing updated Design Code documentation is during MOC expansion projects

# Design and Installation Codes and Standards Employed

To the best of the undersigned's knowledge, the Room 3 Accumulator Replacement at Company XYZ was designed and installed in accordance with the following codes and standards:

- 2013 California Mechanical Code Chapter 11 *Refrigeration*
- 2013 California Fire Code Section 606 *Mechanical Refrigeration*
- ANSI/IIAR 2-2008 Addendum B *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*
- ANSI/IIAR 2-2014 *Standard for Safe Design of Closed Circuit Ammonia Refrigeration Systems*
- ANSI/IIAR 4-2015 *Installation of Closed-Circuit Ammonia Refrigeration Systems*
- ANSI/ASHRAE 15-2013 *Safety Standard for Refrigeration Systems*
- ASME B31.5-2013 *Refrigeration Piping and Heat Transfer Components*
- 2015 ASME Boiler & Pressure Vessel Code Section VIII *Rules for Construction of Pressure Vessels, Division 1*

| Print Name | Signature | Date |
| --- | --- | --- |

# Process Safety Information

**Safety Systems**

- Ammonia Detection
- Emergency Shutdown Switch
- Emergency Control (Dump) Box vs Emergency Pressure Control System
- Eyewash & Shower Stations
- Diffusion Tanks

# Training – Every 3 Years in 3 Categories

| Process | Procedures | Response |
|---|---|---|
| **RETA**<br>• CARO (Book 1)<br>• CIRO (Book 2)<br>• Electrical Books<br>**Equivalent to RETA**<br>• Basic Refrigeration Theory<br>• Recognition of Components and their Function<br>• Operating Limits & Consequences of Deviation | • Operating Procedures<br>• Maintenance Procedures<br>• Safe Work Practices | • Evacuation Drills<br>• Roles and Responsibilities<br>• Hazwoper<br>  • FRA<br>  • FRO<br>  • Tech |

# Operating Procedures

## Operating Phases

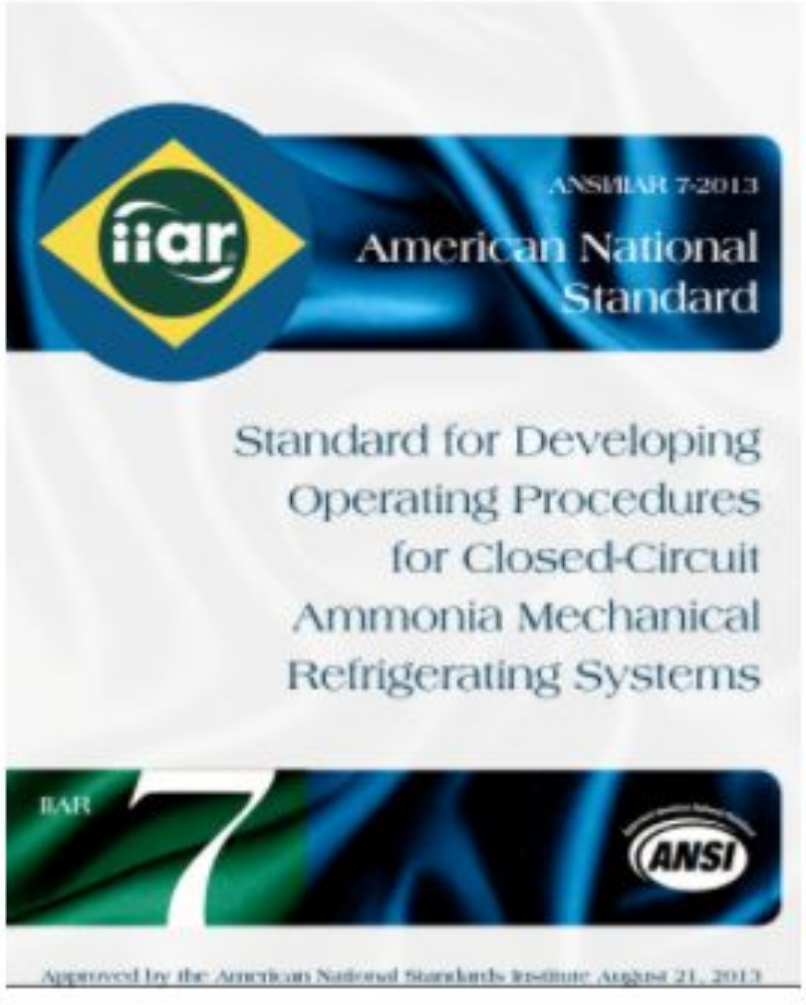
- Initial Startup
- Normal Operations
- Temporary Operations
- Emergency Shutdown
- Emergency Operations
- Normal Shutdown
- Startup Following a Turnaround

## SOP Categories

- Operating Limits
- Safety and Health
- Safety Systems

## Safe Work Practices

- Confined Spaces
- Lockout Tagout
- Line Break
- Contractor Entrance



# Management of Change / Pre-Startup Safety Review

- "The owner or operator shall establish and implement written procedures to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and **procedures**; and, changes to **stationary sources** that affect a covered process." (§ 2760.6)

- When is MOC/PSSR required?

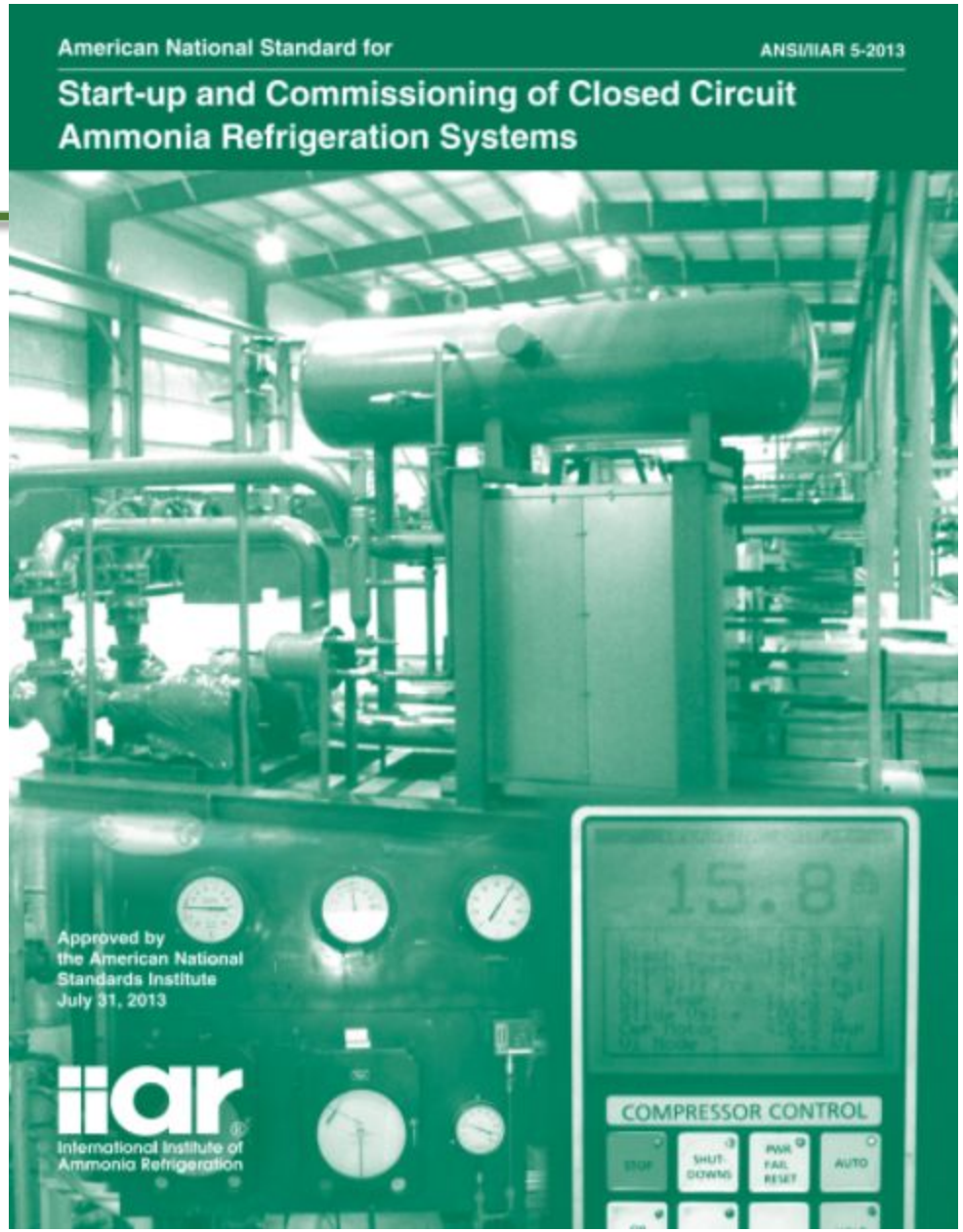
# Management of Change / Pre-Startup Safety Review

- The basic idea of MOC / PSSR is to monitor and document the change to ensure that any and all modifications are in accordance with current codes and standards and any affected program documentation (such as drawing, procedures, training) is updated.


CALIFORNIA CUPA FORUM

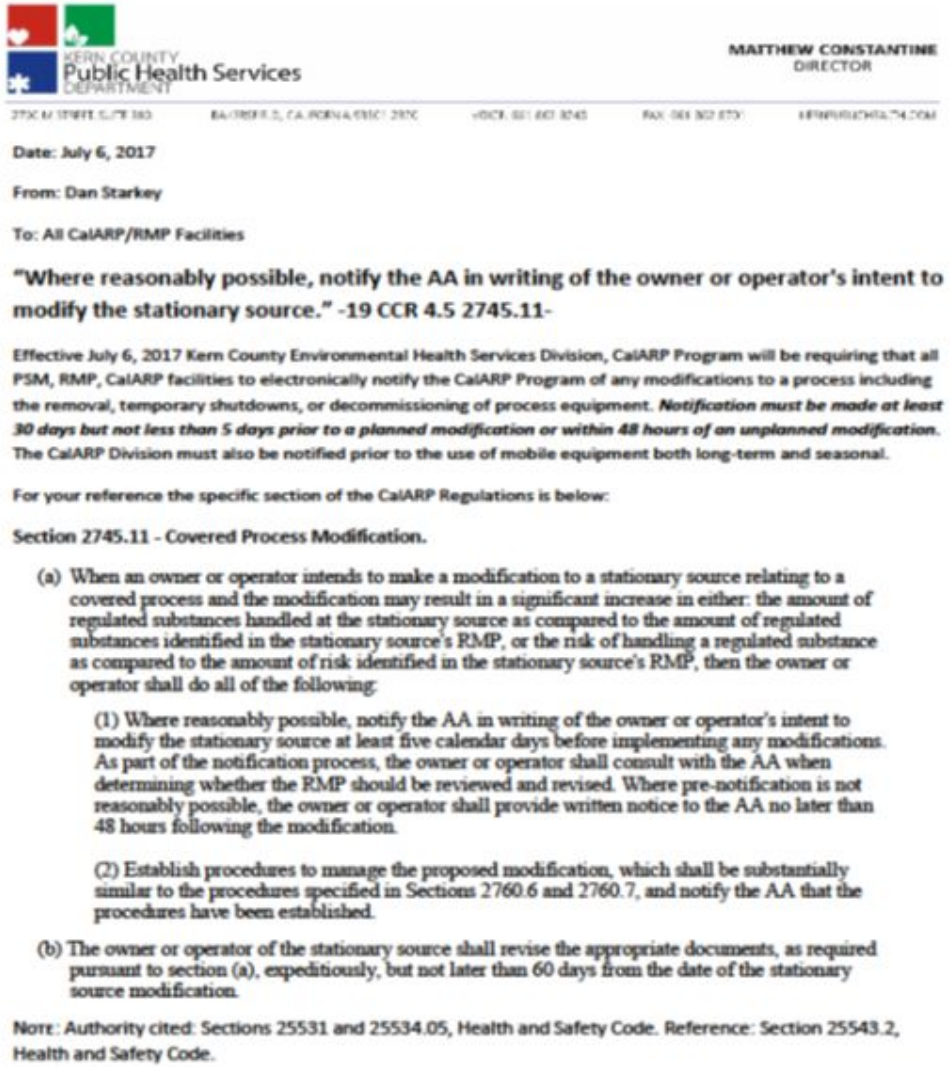
# Management of Change
# Pre-Startup Safety Review

- ANSI/IIAR 5-2019 | Start-Up of Closed-Circuit Ammonia Refrigeration Systems



# Management of Change

- Coordination with the CUPA
  - What does coordination look like for your region?



KERN COUNTY
Public Health Services
DEPARTMENT

MATTHEW CONSTANTINE
DIRECTOR

Date: July 6, 2017

From: Dan Starkey

To: All CalARP/RMP Facilities

**"Where reasonably possible, notify the AA in writing of the owner or operator's intent to modify the stationary source." -19 CCR 4.5 2745.11-**

Effective July 6, 2017 Kern County Environmental Health Services Division, CalARP Program will be requiring that all PSM, RMP, CalARP facilities to electronically notify the CalARP Program of any modifications to a process including the removal, temporary shutdowns, or decommissioning of process equipment. ***Notification must be made at least 30 days but not less than 5 days prior to a planned modification or within 48 hours of an unplanned modification.*** The CalARP Division must also be notified prior to the use of mobile equipment both long-term and seasonal.

For your reference the specific section of the CalARP Regulations is below:

**Section 2745.11 - Covered Process Modification.**

(a) When an owner or operator intends to make a modification to a stationary source relating to a covered process and the modification may result in a significant increase in either: the amount of regulated substances handled at the stationary source as compared to the amount of regulated substances identified in the stationary source's RMP, or the risk of handling a regulated substance as compared to the amount of risk identified in the stationary source's RMP, then the owner or operator shall do all of the following:

(1) Where reasonably possible, notify the AA in writing of the owner or operator's intent to modify the stationary source at least five calendar days before implementing any modifications. As part of the notification process, the owner or operator shall consult with the AA when determining whether the RMP should be reviewed and revised. Where pre-notification is not reasonably possible, the owner or operator shall provide written notice to the AA no later than 48 hours following the modification.

(2) Establish procedures to manage the proposed modification, which shall be substantially similar to the procedures specified in Sections 2760.6 and 2760.7, and notify the AA that the procedures have been established.

(b) The owner or operator of the stationary source shall revise the appropriate documents, as required pursuant to section (a), expeditiously, but not later than 60 days from the date of the stationary source modification.

Note: Authority cited: Sections 25531 and 25534.05, Health and Safety Code. Reference: Section 25543.2, Health and Safety Code.

# Questions?


Alvin Lal
Stanislaus County
Email: alal@envres.org
Phone: 209-525-6793

Uriah Donaldson, OHST
Resource Compliance
Email: udonaldson@resourcecompliance.com
Phone: 559-426-0072