CalARP 101

Presented by
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Condor Earth

25th Annual California CUPA Training Conference

March 20 – 23, 2023

Agenda

California Accidental Release Prevention (CalARP) Program Overview

- Purpose and Scope
- Definitions
- Applicability and Exemptions
- General Requirements
- Management System
- Registration and Submission
- Hazard Assessment
- Prevention Program Requirements
- Emergency Response Program

Objective

- Evaluate chemical inventory for regulated substances;
- Demonstrate ability to define a covered process; and,
- Understand CalARP program applicability components

Purpose and Scope

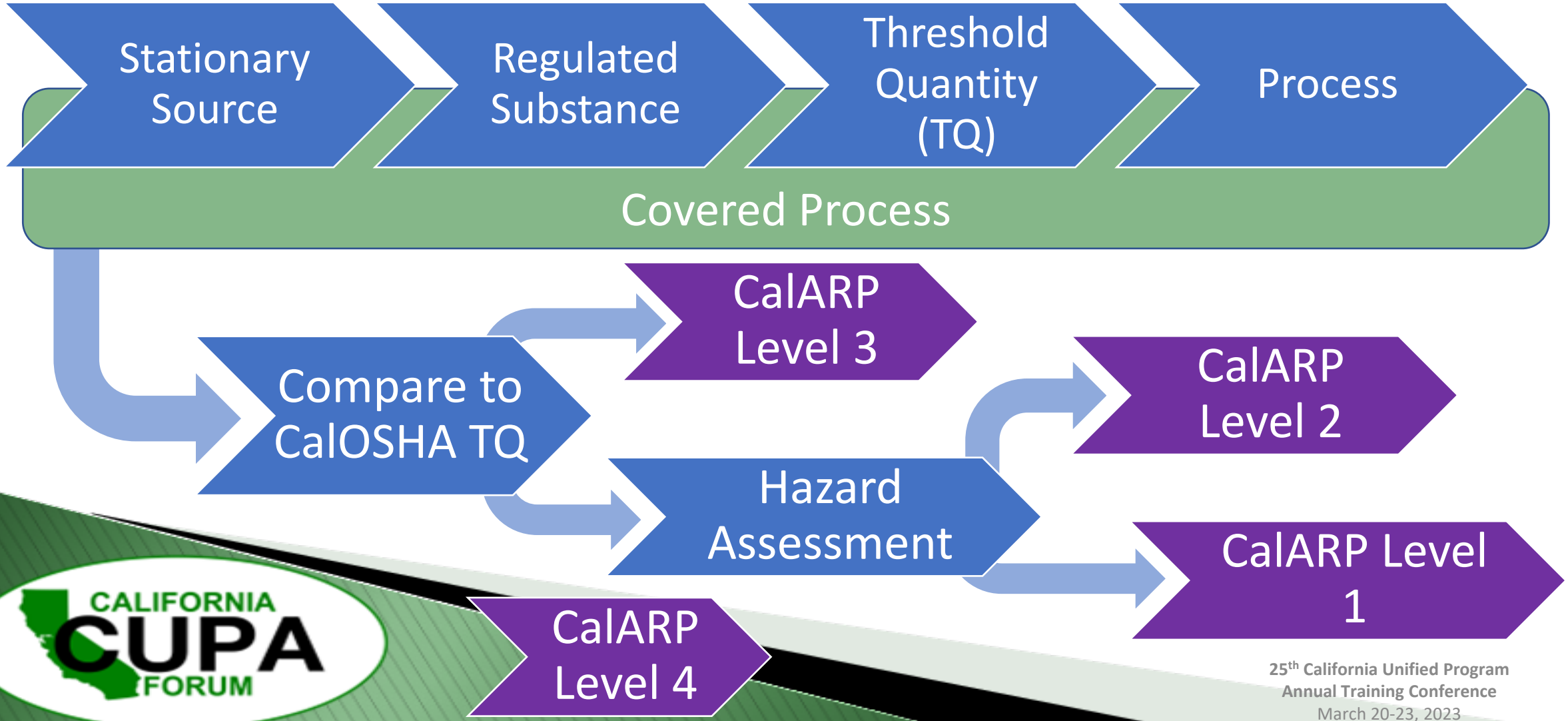
- Prevent accidental releases of substances that can cause serious harm to the public and the environment;
- Minimize the damage if releases do occur; and,
- Satisfy community right-to-know laws.

Purpose and Scope

California Accidental Release Prevention (CalARP) Program Title 19, Division 2, Chapter 4.5

- Establishes thresholds for regulated substances;
- Sets requirements for stationary sources; and,,
- Defines CalARP Program roles for the Unified Program Agency (UPA) and owner/operator.

Applicability



Applicability Definitions

"**Stationary source**" means any **buildings, structures, equipment, installations, or substance emitting stationary activities** which belong to the same industrial group, which are located on one or more contiguous properties, which are under the control of the same person (or persons under common control), and from which an accidental release may occur. The **term stationary source does not apply to transportation**, including storage incident to transportation, of any regulated substance or any other extremely hazardous substance under the provisions of this chapter. A stationary source **includes transportation containers used for storage** not incident to transportation and transportation containers connected to equipment at a stationary source for loading or unloading.

Applicability Definitions

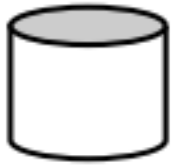
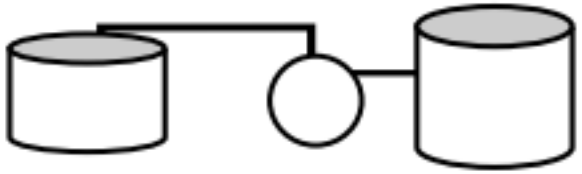
"**Threshold quantity**" (TQ) means the **quantity specified for a regulated substance** pursuant to Section 2770.5 and determined to be present **at a stationary source** as specified in Section 2770.2 of this chapter.

"**Regulated substance**" (RS) means any **substance**, unless otherwise indicated, **listed in** Section 2770.5 of this chapter.

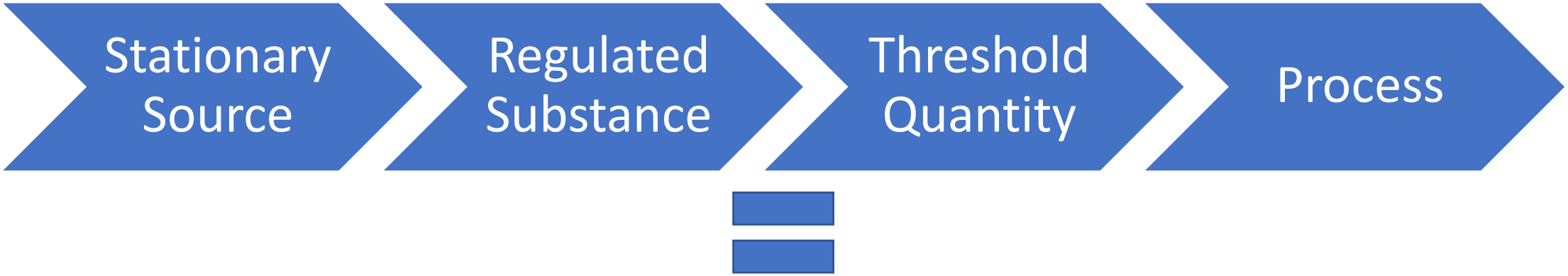
Applicability Definitions

"**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. This definition shall not apply to Article 6.5.

Applicability and Exemptions

Schematic Representation	Description	Interpretation
	1 vessel 1 regulated substance above TQ	1 process
	2 or more connected vessels *different* regulated substance each above TQ	1 process
	2 or more vessels co-located *same* substance total above TQ	1 process
	2 vessels, located so they won't be involved in a single release *same or different* substances each above TQ	2 processes

Applicability Definitions



"**Covered process**" means a process that has a regulated substance present in more than a threshold quantity as determined under Section 2770.2 of this chapter.

Applicability and Exemptions

19 CCR § 2770.5 Table 3 State Regulated Substances List and Threshold Quantities			
Chemical Name	***Also on Table 1***	***CAS Number***	***State Threshold Quantity (lbs)***
Ammonia[5]	yes	7664-41-7	500
Chlorine	yes	7782-50-5	100
Dimethoate	no	60-51-5	500/10,000[3]
Nitric Acid	yes	7697-37-2	1,000
Methyl Bromide	no	74-83-9	1,000
Peracetic Acid	yes	79-21-0	500

Applicability and Exemptions

Example 1:

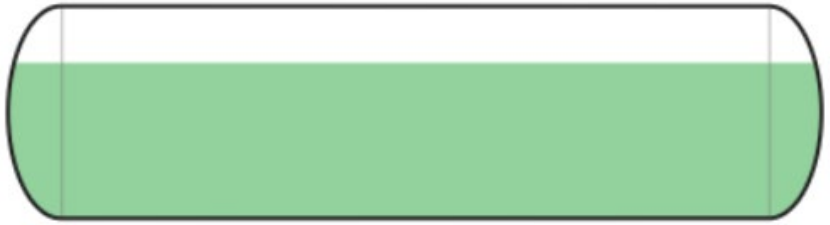
Ammonia refrigeration system with a maximum intended inventory equivalent to 80% of the 581-gallon high-pressure receiver.

581 x 80% = 464.8 gallons

[volume] x [density] x [concentration] = total lbs

464.8 gallons x 5.15 lbs/gallon = 2,394 pounds

Exceeds 500 pound TQ



Filled Volume	US gal	464.8
Total Volume	US gal	581.6

Applicability and Exemptions

Count regulated substances in a mixture:

- ☑ Greater than 1% and
- ☑ Vapor pressure at or above 10 mm Hg.

Refrigeration grade anhydrous ammonia purity is 99.95% or greater

Vapor pressure is 110 psig or 5688.64 mm Hg.

Applicability and Exemptions

Example 2: Five co-located 2,000-gallon tanks for 38% nitric acid and water solution.

[process volume] x [density] x [concentration of RS] = total pounds

10,000 gallons x 10.46 lbs/gallon x 38% = 39,748 pounds nitric acid

Applicability and Exemptions

Count regulated substances in a mixture:

- Greater than 1% and ☑
- Vapor pressure at or above 10 mm Hg. ?

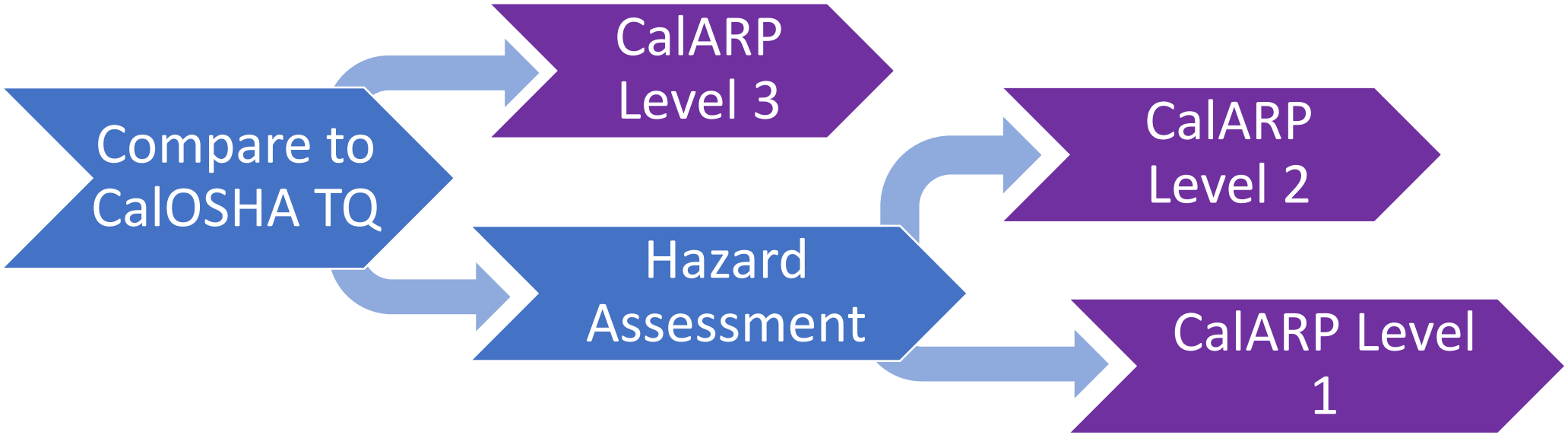
SDS lists a vapor pressure of solution at 42 mm Hg at 60 °F.

Raoult's Law can be used to find partial vapor pressure of nitric acid.

Applicability and Exemptions

Chemical Name	*CAS Number*	*State Threshold Quantity (lbs)*	*CalOSHA Threshold Quantity (lbs)*
Ammonia[5]	7664-41-7	500	10,000
Chlorine	7782-50-5	100	1,500
Dimethoate	60-51-5	500/10,000[3]	Not listed
Nitric Acid	7697-37-2	1,000	Nitric acid ≥ 94.5%, 500
Methyl Bromide	74-83-9	1,000	2,500
Peracetic Acid	79-21-0	500	Containing ≥ 60% acetic acid, 1,000

Applicability



Check stationary source NAICS codes for automatic CalARP Level 3 designation.

NAICS 324110, Petroleum Refineries CalARP Level 4

Applicability and Exemptions

Table 2 Federal Regulated Flammable Substances List and Threshold Quantities for Accidental Release Prevention			
Chemical Name	***CAS Number***	***Threshold Quantity (lbs)***	***Basis for listing***
Acetaldehyde	75-07-0	10,000	g
Propane	74-98-6	10,000	f
Vinyl chloride [Ethene, chloro-]	75-01-4	10,000	a,f

Applicability and Exemptions

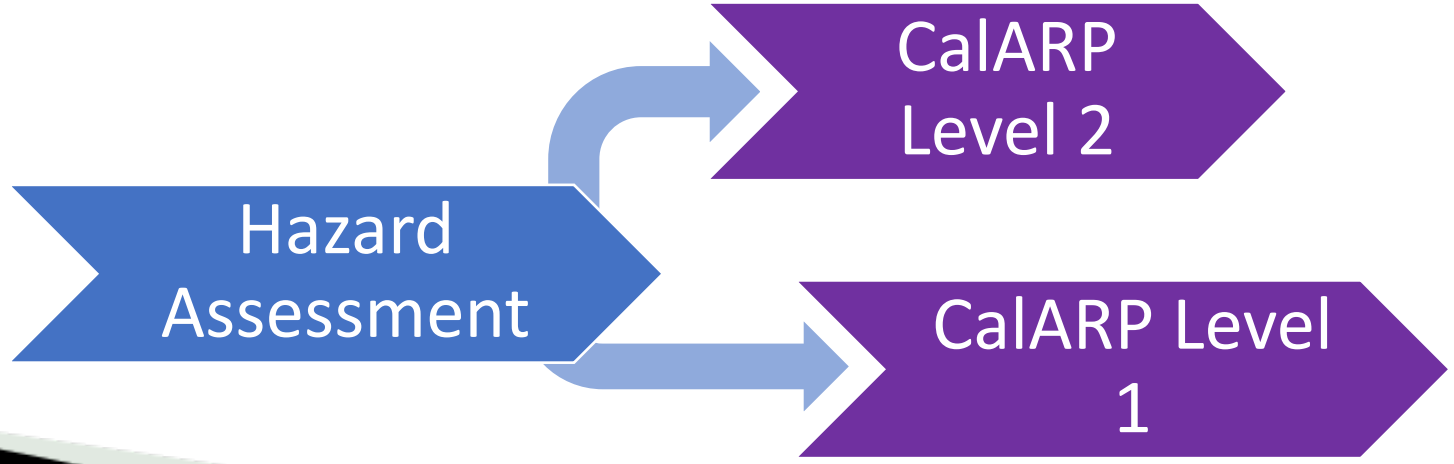
Count regulated flammable substances in a mixture:

- Greater than 1%;
- Only count the regulated substance in the mixture, with NFPA flammability rating of 3 or less; and,
- Count entire weight of a mixture with NFPA flammability of 4.

Applicability and Exemptions

Example 3: 12,000 pounds of vinyl chloride.

Process exceeds the 10,000-pound threshold quantity and is not a CalOSHA highly-hazardous chemical.



General Requirements

- Coordinate with the CUPA on development of the Risk Management Plan (RMP); and,
- Complete CalARP program level specific requirements in Section 2735.5

General Requirements

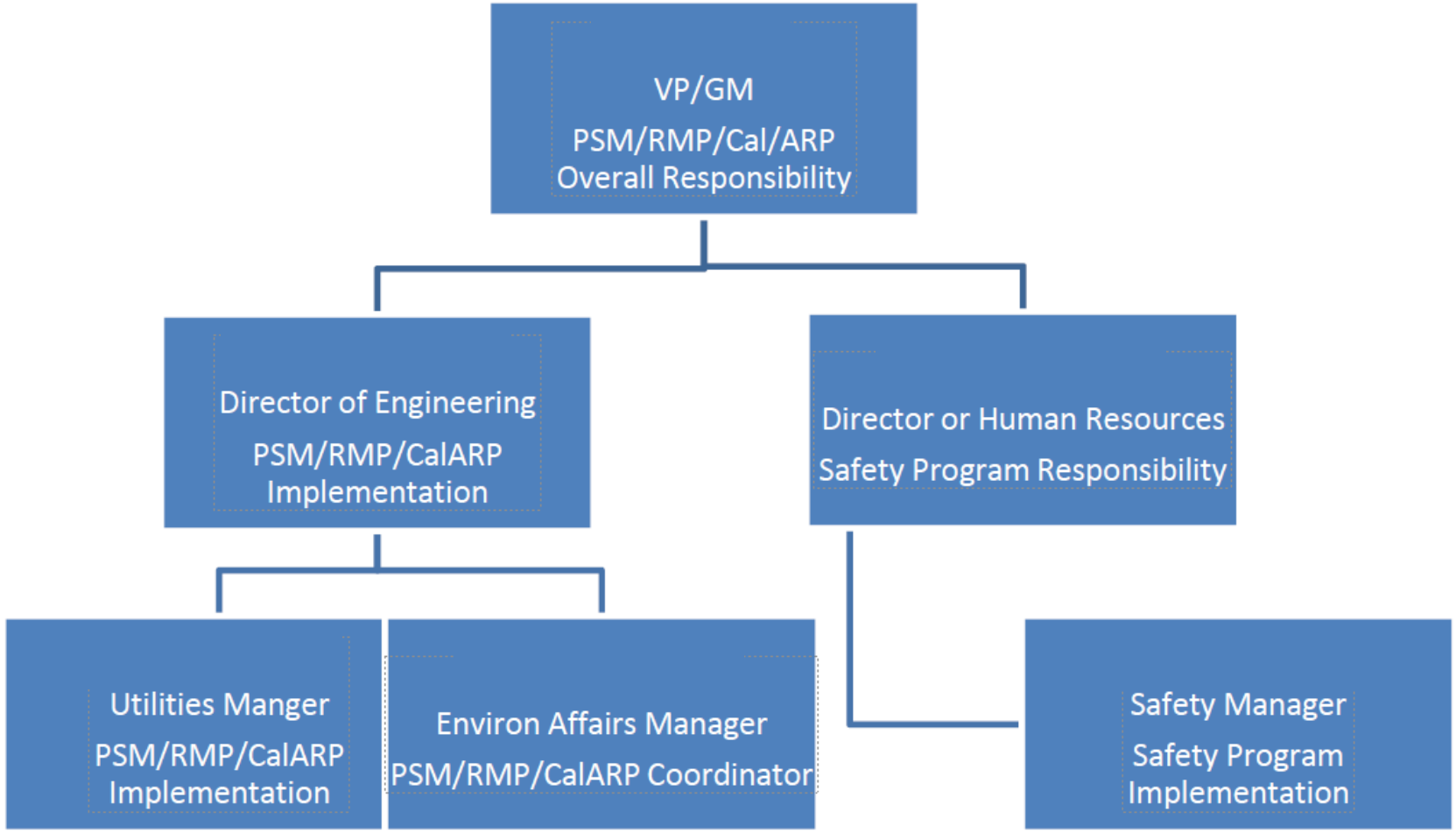
- Registration.....*(CalARP/RMP)*
- Executive Summary.....(*CalARP/RMP*)
- Management System.....*(CalARP/RMP)*
- Prevention Program Elements.....*(CalARP/RMP/PSM)*
- Hazard Assessment.....*(CalARP/RMP)*
- Emergency Response Program....*(CalARP/RMP/PSM)*

Management System

Develop a management system to oversee the implementation of CalARP Level 2 - 4 RMPs

- Identify person with overall responsibility and, if necessary
- Outline names or titles and lines of authority in an organizational chart.

Management System



Management System

RMP/PSM Elements	Responsibility
1) Overall RMP Responsibility:	A) President/CEO – Overall Responsibility for the development, implementation and integration of the risk management plan.
2) Employee Participation:	A) Maintenance Department Supervisor B) Safety Manager
3) Process Safety Information:	A) Maintenance Department Supervisor B) Safety Manager
4) Process Hazard Analysis:	A) Maintenance Department Supervisor B) Safety Manager C) Plant Manager
5) Operating Procedures:	A) Maintenance Department Supervisor B) Safety Manager
6) Lockout/Tagout:	A) Maintenance Department Supervisor B) Safety Manager
7) Line Break and Hot Work Permits:	A) Maintenance Department Supervisor B) Safety Manager
8) Training:	A) Maintenance Department Supervisor B) Safety Manager
10) Mechanical Integrity:	A) Maintenance Department Supervisor B) Safety Manager C) Plant Operators D) Contractors
11) Management of Change:	A) Maintenance Department Supervisor B) Safety Manager
12) Pre-Startup Safety Review:	A) Maintenance Department Supervisor B) Safety Manager
13) Compliance Audits:	B) Safety Manager
14) Incident Investigations:	B) Safety Manager
15) Contractors:	A) Maintenance Department Supervisor B) Safety Manager
16) Emergency Response Program:	A) Maintenance Department Supervisor B) Safety Manager C) Plant Manager

Registration and Submission

Registration information with RMP submission (CalARP 1 - 4)

- Basic information on stationary source and process
- Certification of accuracy

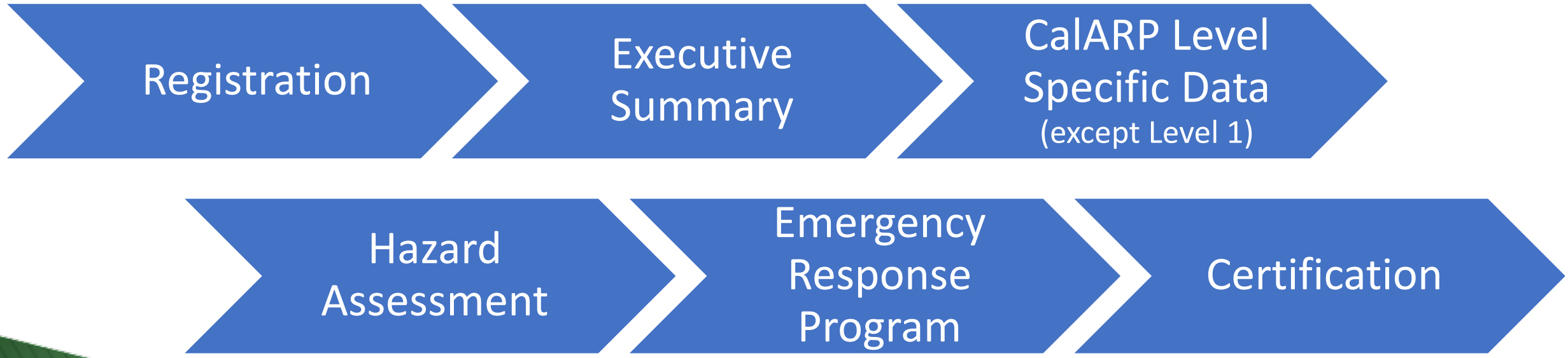
CAL-ARP PROGRAM REGISTRATION FORM

I. Registration:

Registration Type:	Revision Type:	
☐ New ☐ Revision	☐ Updates and Re-Submissions per 2745.10 (a) and (b) ☐ De-registration per 2745.10 (c) or (d)	☐ Corrections per 2745.10.5 ☐ Withdrawals

Registration and Submission

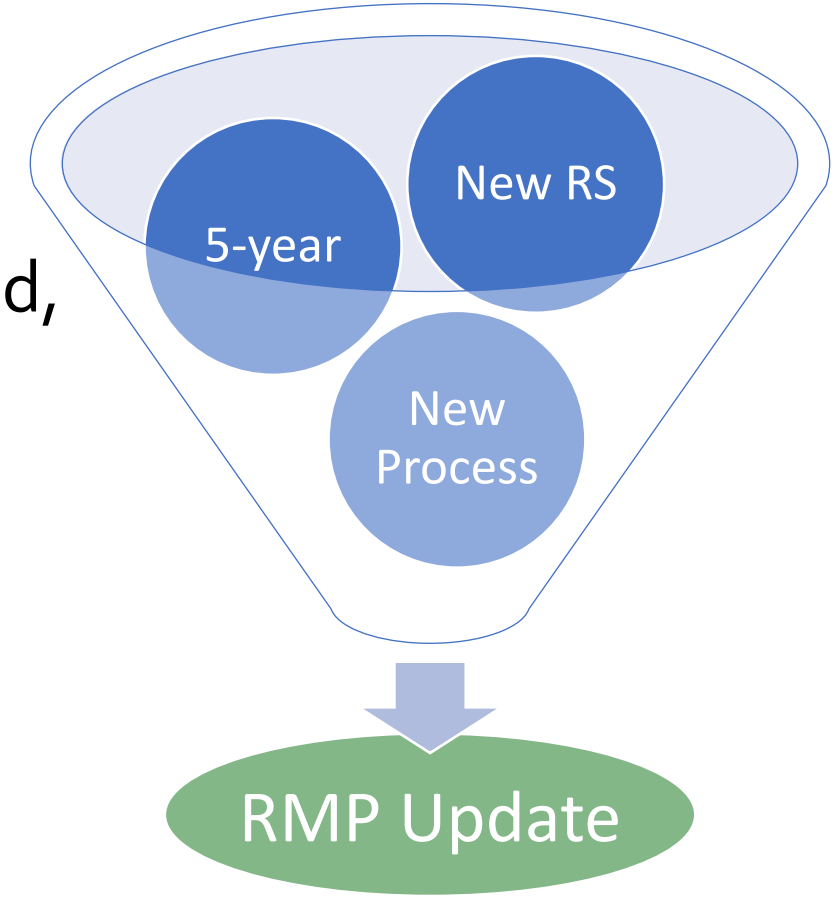
All CalARP Program Levels



Registration and Submission

CalARP RMP updates:

- At least every 5 years;
- Within 3 years a newly regulated substance; and,
- Before the addition of a new process.

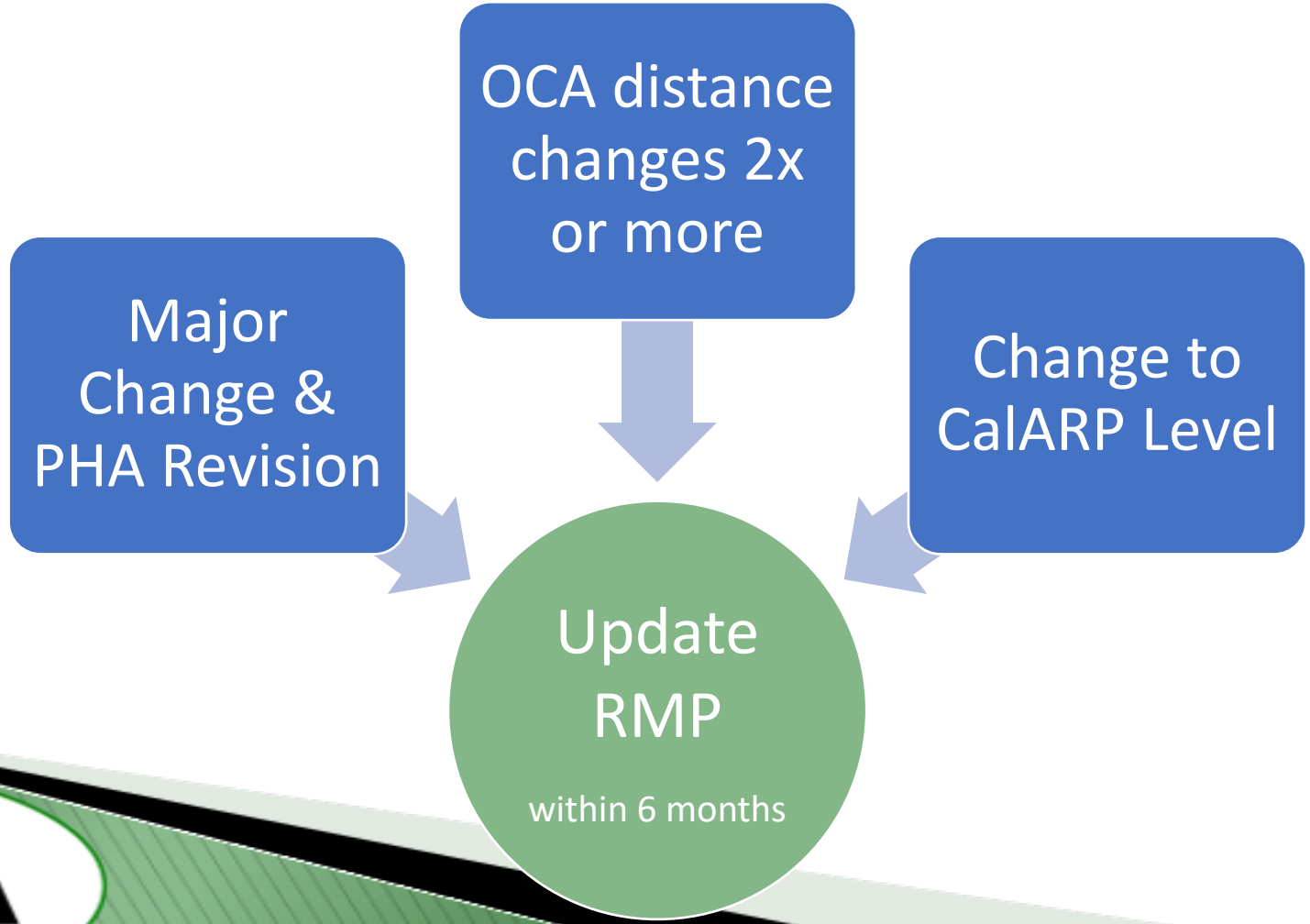


Registration and Submission

CalARP RMP update within 6 months of a change that:

- Requires a revised process hazard analysis or hazard review (major change);
- Requires a revised offsite consequence analysis (distance to toxic endpoint changes by factor of 2);
- Alters the CalARP program level; or
- Removes CalARP applicability from stationary source (submit de-registration)

Registration and Submission



Definitions

"**<u>Major change</u>**" means:

(1) introduction of a **new process**, or

(2) new process equipment, or new regulated substance that results in any **operational change outside of established safe operating limits**; or

(3) any alteration in a process, process equipment, or process chemistry that **introduces a new hazard or increases an existing hazard**.

Registration and Submission

CalARP stationary source modifications:

- Increase the amount of RS; or
- Increase risk of modification compared to risk described in RMP.

Owner Operator Requirements:

- Notify the CUPA in writing 5 days before modification or 48 hours after;
- Consult with CUPA to determine if RMP review or revision is warranted;
- Establish procedures for managing changes (MOC and PSSR); and,
- Revise documentation within 60 days of modification.

Registration and Submission

CalARP RMP correction:

- After a qualifying accidental release (5-year accident history); and,
- Within 30 days of change in emergency contact information.

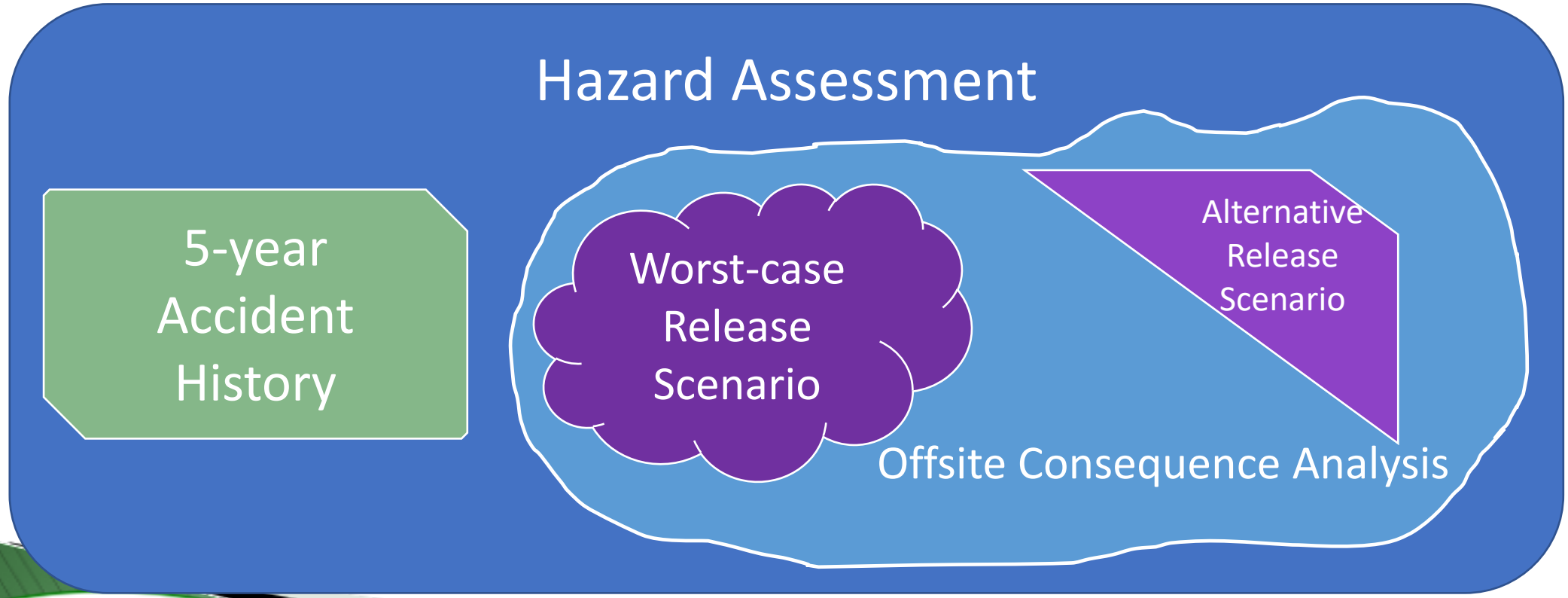
Corrections don't reset the 5-year anniversary date.

Registration and Submission

Executive Summary is required for all program levels and includes a brief description of:

- Accidental release prevention and emergency response policies;
- Stationary Source and regulated substances handled;
- Accidental release prevention program and chemical specific prevention steps;
- Five-year accidental history;
- Emergency response program; and,
- Planned changes to improve safety

Hazard Assessment



Definitions

"**Worst-case release**" means the release of the **largest quantity of a regulated substance from a vessel or process** line failure that results in the greatest distance to an endpoint defined in Section 2750.2(a) of this chapter.

"**Offsite**" means areas **beyond the property boundary** of the stationary source, and areas within the property boundary to which the **public has routine and unrestricted access** during or outside business hours.

Hazard Assessment

Toxic endpoints listed in Appendix A

CAS Number	Chemical Name	Endpoint (mg/l)
7664-41-7	Ammonia	0.14
7782-50-5	Chlorine	0.0087
79-21-0	Peracetic Acid	0.0045
7446-09-5	Sulfur Dioxide	0.0078

Verify parameters match substance, process and the stationary source.

Hazard Assessment

Worst-case release parameters:

Winds speed: 1.5 meters/second

Atmospheric stability class: F

Ambient temperature/humidity:

Highest daily temperature from the previous three years and average humidity

Or 25 °C and 50% humidity (RMP OCA Guidance)

Height of release: 0 ft (ground level)

Surface roughness:

Urban or Rural depending site conditions

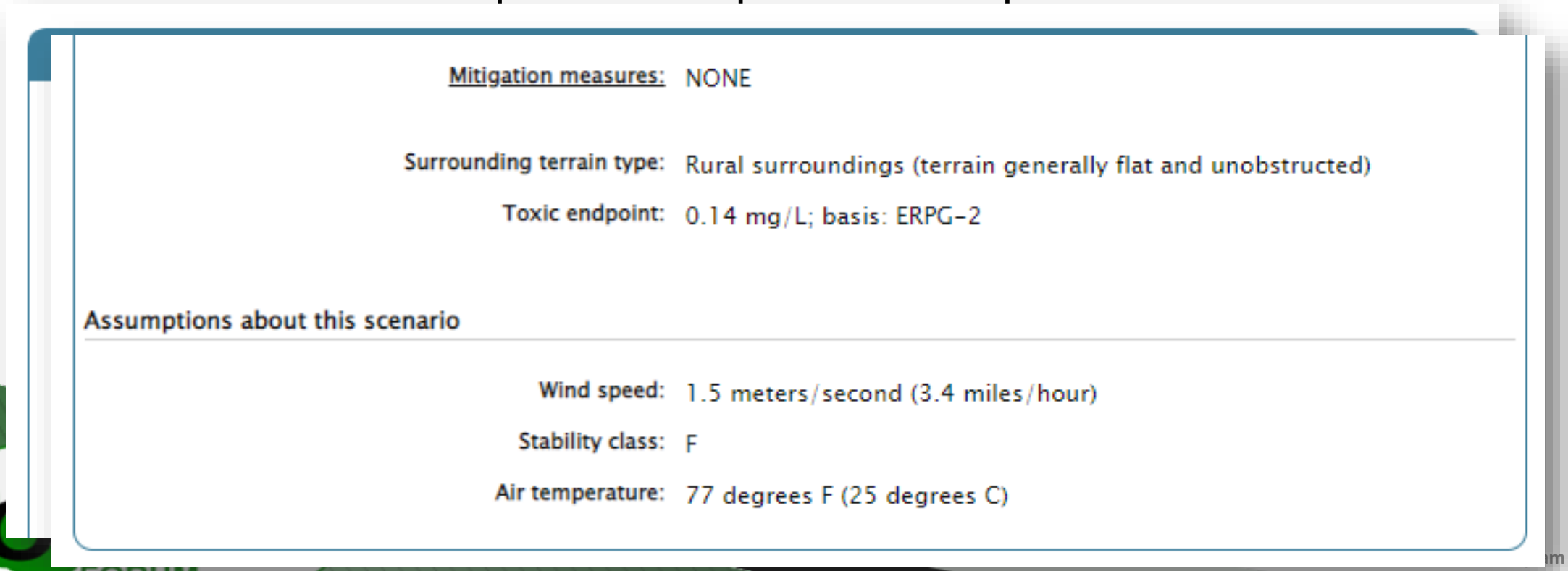
Temperature of regulated substance:

Highest daily maximum temperature or maximum process temperature (whichever is higher)

Hazard Assessment

One worst-case release scenario per stationary source

- Unless additional public receptors are impacted.

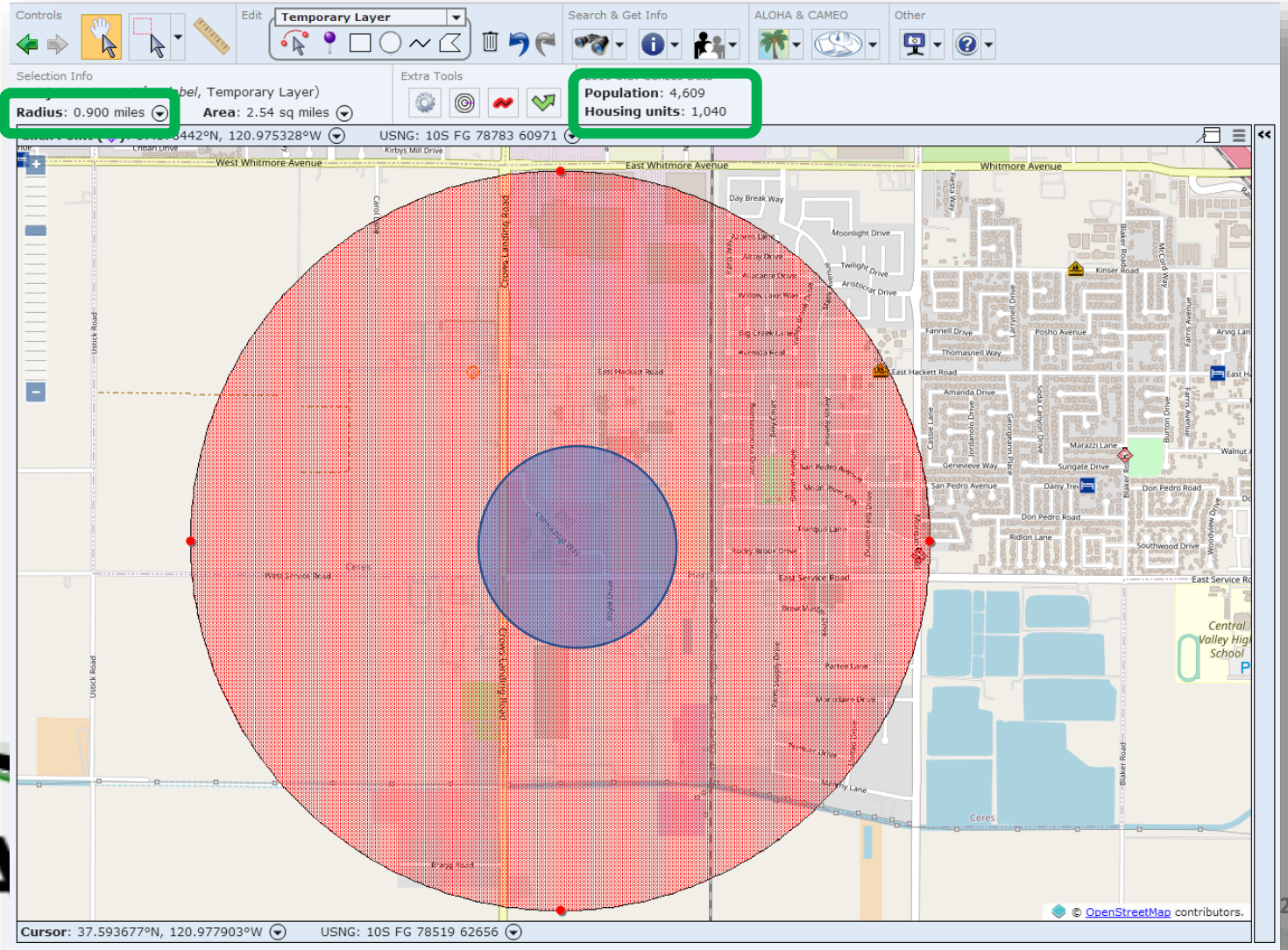


Mitigation measures:	NONE
Surrounding terrain type:	Rural surroundings (terrain generally flat and unobstructed)
Toxic endpoint:	0.14 mg/L; basis: ERPG-2

Assumptions about this scenario

Wind speed:	1.5 meters/second (3.4 miles/hour)
Stability class:	F
Air temperature:	77 degrees F (25 degrees C)

Hazard Assessment



Hazard Assessment

One alternative release is required for each regulated substance in a process, except CalARP Level 1.

Alternative release should be:

- More likely to occur than worst-case; and,
- Reach an offsite endpoint and public receptor, unless no scenario exists.

Select a scenario that was in five-year accident history, industry accidents/incidents or scenarios covered in a hazard review or PHA.

Hazard Assessment

Alternative release parameters:

Typical atmospheric conditions for wind, atmospheric stability class, temperature and humidity.

Height of release: Dependent on release scenario

Surface roughness: Urban or Rural depending site conditions

Temperature of regulated substance: Ambient temperature or process temperature appropriate for scenario

Hazard Assessment

Offsite Impacts to Public

- Population
- Schools
- Hospitals
- Long term health care facilities
- Child day care facilities
- Prisons
- Parks and recreation areas
- Major commercial, office and industrial buildings

Offsite Impacts to Environment

- National or state parks, forests, or monuments;
- Officially designated wildlife sanctuaries, preserves or refuges; and,
- Federal wilderness areas.

USGS maps can be used to identify environmental receptors.

Hazard Assessment

Five-year Accident History:

- Release resulted in deaths, injuries, or significant property damage on site, or
- Known offsite deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage

Releases from a process that qualify for 5-year accident history disqualify a process from CalARP Level 1 designation.

Hazard Assessment

Five- **istory:**

- Rele ths, injuries, or significant property damage on s
- Kno njuries, evacuations, sheltering in place, pro| nvironmental damage

Tues 10:15-12:00	Tu-A1 BASIC CAMEO/ALOHA/MARPLOT (Tom Bergman)

Releases from a process that qualify for 5-year accident history disqualify a process from CalARP Level 1 designation.

Program Level

CalARP Level 1

Prevention Program

CalARP Level 2 vs Level 3

Level 2 Requirements

Safety Information
Operating Procedures
Training
Maintenance
Incident Investigation
Hazard Review
Compliance Audits

Level 3 Requirements

Process Safety Information
Operating Procedures
Training
Mechanical Integrity
Incident Investigation
Process Hazard Analysis
Compliance Audits
Employee Participation
Contractors
Hot Work Permit
Management of Change
Pre-startup Safety Review

Prevention Program

Mon 10:00-11:45	M-A2 RAGAGEP: HISTORICAL VARIANTS AND THE IMPORTANCE OF IIAR STANDARDS (Uriah Donaldson, Resource Compliance)
Mon 1:00-2:45	M-A3 MECHANICAL INTEGRITY INSPECTION OF AN AMMONIA PRESSURE VESSEL (Peter Thomas, Resource Compliance) Video

Tues 1:00-2:45	Tu-A2 CONDUCTING EFFECTIVE AMMONIA REFRIGERATION AUDITS & INSPECTIONS (Eileen Woodbury, Applied Process Cooling Inc; Alvin Lal, Stanislaus County DER)
Tues 3:00-4:45	Tu-A3 CALARP 201 (Uriah Donaldson, Resource Compliance; Alvin Lal, Stanislaus County DER) Video

Wed 10:00-11:45	W-A2 MANAGEMENT OF CHANGE & PRE-STARTUP SAFETY REVIEW (Diane Ho, Thomas Turner and Albert Welsh, Air Liquide Large Industry)
Wed 1:00-2:45	W-A3 APPLICATIONS OF P&ID DRAWINGS WITHIN SELECT PREVENTION PROGRAM (Eileen Woodbury, Applied Process Cooling Inc; Alvin Lal, Stanislaus County DER)

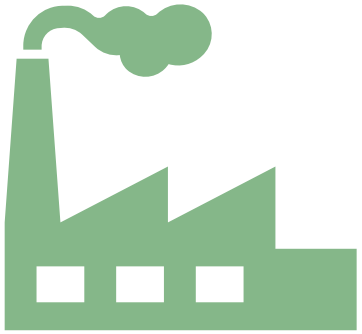
Wed 3:00-4:45	W-A4 Recent Changes to Ammonia Refrigeration RAGAGEP (Eli Macha, Resource Compliance; Chad Collin, Resource Compliance) Video
Thur 8:00-9:45	Th-A1 CONDUCTING AN EFFECTIVE Process Hazard Analysis (Jack Becker, Condor Earth Technologies)

CALIFORNIA CUPA FORUM

Prevention Program

CalARP Level 4

Petroleum Refineries



Level 4 Requirements

Process Safety Information
Process Hazard Analysis
Operating Procedures
Training
Mechanical Integrity
Incident Investigation
Compliance Audits

Employee Participation
Contractors
Hot Work Permit
Management of Change
Pre-startup Safety Review

Safeguard Prevention Analysis
Hierarchy of Hazard Control Analysis
Process Safety Culture Assessment
Human Factors Program
Management System

Prevention Program

CalARP Level 4

Petroleum Refineries

Level 4 Requirements

Process Safety Information
Process Hazard Analysis
Operating Procedures

Employee Participation
Contractors
Hot Work Permit
Management of Change
Pre-startup Safety Review

M-A4 HUMAN FACTORS (Miguel Zepeda, Contra Costa County HS) Video	Thur 10:00-11:45
	Th-A2 OCT 2017 PARADIGM SHIFT FOR CA PETROLEUM REFINERIES PSM/CALARP + MAXIMIZING HAZOP/LOPA QUALITY (Steve Maher, Risk Mgmnt Professionals)

d Prevention Analysis
y of Hazard Control Analysis
afety Culture Assessment
actors Program
ment System

Emergency Response Program

Emergency Action Plan (EAP)

- Evacuate, deny entry and notify

Requirements:

- Current and accepted HMBP; and,
- Documentation on coordination of response actions.

Emergency Response Plan (ERP)

- Procedures for emergency planning, response and informing responders;
- Equipment, personnel and training;
- First-aid and medical treatment;
- Procedures after response; and,
- Coordination with community plan.

Emergency Response Program

RELEASE REPORTING REQUIREMENTS MATRIX

AIR INCIDENTS					
TYPES OF RELEASES	**AMOUNT**	**WHO REPORTS?**	**TO WHOM**	**WHEN**	**LEGAL AUTHORITY**
Release or Threatened Release (except transporting on highway)	If there is a reasonable belief that the release poses a significant hazard to human health & safety, property, or environment.**	Handler	Cal OES, CUPA, and/or 911	Immediately upon knowledge of a release.	HSC 25510
Proximity to Schools	A release within ½ mile of a school.	Emergency rescue personnel	Superintendent of affected school district	Immediately upon knowledge of a release.	HSC 25510.3
	A threat of an air contaminant within 1000 feet of a school.	Air Pollution Control Officer	CUPA, Local Fire Dept	Within 24 hours	HSC 42301.7

Emergency Response Program

RELEASE REPORTING REQUIREMENTS MATRIX

Types of Releases	Amount			When	Legal Authority
Release or Threatened Release (except transporting on highway)	If there is a reasonable belief that the release poses a significant hazard to human health & safety, property, or environment.**		ES, A, 911	Immediately upon knowledge of a release.	HSC 25510
Proximity to Schools	A release within ½ mil… a school.		personnel	…nt of affected school district	Immediately upon knowledge of a release.	HSC 25510.3
	A threat of an air contaminant within 1000 feet of a school.	Air Pollution Control Officer	CUPA, Local Fire Dept	Within 24 hours	HSC 42301.7

Th-F1 PRESCRIPTIVE VS. PERFORMANCE BASED EMERGENCY RESPONSE (Eileen Woodbury, Applied Process Cooling Inc. Scott Melton, SCS Tracer)

Review

CalARP Overview

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- General Requirements
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- Emergency Response Program

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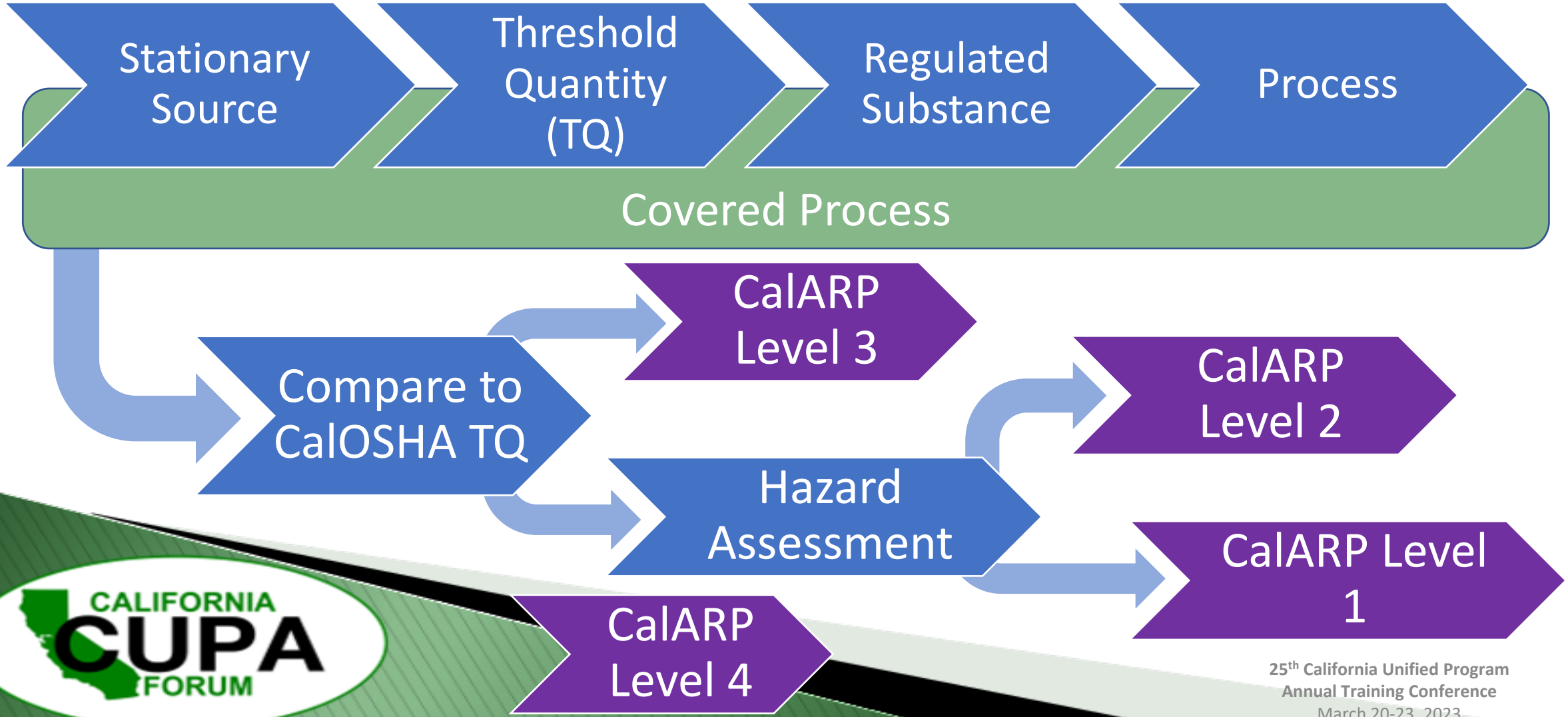
- Demonstrate ability to define a covered process; and,
- Understand CalARP program applicability components

Applicability



Any Questions?

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