Final Proposed Regulation Text

Proposed Amendments to California Code of Regulations, Title 19, Division 5, Chapter 2

Note: The proposed amendments per Government Code section 11346.2 subdivision (a)(3) are shown in underline to indicate additions and strikeout to indicate deletions from the existing regulatory text. (1 CCR § 46.)

California Environmental Protection Agency

California Accidental Release Prevention (CalARP) Program Detailed Analysis

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Article 1. General

§ 5050.3. Definitions.

For the purposes of this chapter only:

(a) "Accidental release" means an unanticipated emission of a regulated substance or other extremely hazardous substance into the ambient air from a stationary source.

(b) "Administrative controls" means written procedural mechanisms used for hazard control.

(c) "Administrator" means the administrator of the USEPA.

(d) "Agency" means the California Environmental Protection Agency.

(e) "AIChE/CCPS" means the American Institute of Chemical Engineers/Center for Chemical Process Safety.

(f) "API" means the American Petroleum Institute.

(g) "Article" means a manufactured item, as defined under Section 5189 of Title 8 of the California Code of Regulations (CCR), that is formed to a specific shape or design during manufacture, that has end use functions dependent in whole or in part upon the shape or design during end use, and that does not release or otherwise result in exposure to a regulated substance under normal conditions of processing and use.

(h) "ASME" means the American Society of Mechanical Engineers.

(i) "Cal OSHA" means the California Occupational Safety and Health Administration.

(j) "CAS" means the Chemical Abstracts Service.

(k) "CFR" means the Code of Federal Regulations.

(l) "Catastrophic release" means a major uncontrolled emission, fire, or explosion, involving one or more regulated substances that presents an imminent and substantial endangerment to public health and the environment.

(m) "Change" means any alteration in process chemicals, technology, procedures, equipment, facilities or organization that could affect a process. A change does not include replacement-in-kind.

(n) "Classified information," as defined in the Classified Information Procedures Act, Appendix 3 of Section 1(a) of Title 18 of the United States Code, means "any information or material that has been determined by the United States Government pursuant to an executive order, statute, or regulation, to require protection against unauthorized disclosure for reasons of national security."

(o) "Condensate" means hydrocarbon liquid separated from natural gas that condenses due to changes in temperature, pressure, or both, and remains liquid at standard conditions.

(p) "Covered process" means a process that has a regulated substance present in more than a threshold quantity as determined under Section 5130.2 of this chapter.

(q) "Crude oil" means any naturally occurring, unrefined petroleum liquid.

(r) "Damage mechanism" means the mechanical, chemical, physical, or other process that results in equipment or material degradation.

(s) "DOT" means the United States Department of Transportation.

(t) "Employee representative" means an employee, who is on-site and qualified for the task, selected by a union, or by the employees in the absence of a union. ~~a union representative, where a union exists, or an employee-designated representative in the absence of a union that is on-site and qualified for the task.~~ The term 'employee representative' is to be construed broadly, and may include ~~the local union, the international union, or an individual designated by these parties,~~ an employee at the site such as the safety and health committee representative~~ at the site~~. Nothing in this subsection shall be construed to supersede an employee representative selection process in a collective bargaining agreement.

(u) "Environmental receptor" means natural areas such as national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas; and Federal wilderness areas, that could be exposed at any time to toxic concentrations, radiant heat, or overpressure greater than or equal to the endpoints provided in Section 5080.2(a), as a result of an accidental release and that can be identified on local United States Geological Survey maps.

(v) "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time taking into account health, safety, economic, environmental, legal, social, and technological factors.

(w) "Field gas" means gas extracted from a production well before the gas enters a natural gas processing plant.

(x) "Hierarchy of Hazard Control" means prevention and control measures, in priority order, to eliminate or minimize a hazard. Hazard prevention and control measures ranked from most effective to least effective are: First Order Inherent Safety, Second Order Inherent Safety, and passive, active and procedural protection layers.

(y) "Highly hazardous material" means a flammable liquid, flammable gas, toxic or reactive substance as those terms are defined: (1) flammable gas, as defined in California Code of Regulation (CCR) Title 8, § 5194, Appendix B, (2) flammable liquid, as defined in CCR Title 8, § 5194, Appendix B, (3) toxic substances as acute toxicity is defined in CCR Title 8, § 5194, Appendix A, and (4) reactive substance as self-reactive chemical, as defined in CCR Title 8, § 5194, Appendix B. Highly hazardous material includes all regulated substances listed in Tables 1, 2, and 3 of this Chapter. Highly hazardous material does not include any substance in quantities below the lesser of the thresholds set forth in the California Hazardous Materials Business Plan rule at California Health and Safety Code § 25507(a)(1)(A) or in Tables 1, 2, and 3 of this Chapter.

(z) "Hot work" means work involving electric or gas welding, cutting, brazing, or similar flame or spark-producing operations.

(aa) "Human factor" means a discipline concerned with designing machines, operations, and work environments so that they match human capabilities, limitations, and needs. Human factors include environmental, organizational, and job factors, and human and individual characteristics, such as fatigue, that can affect job performance, process safety, and health and safety.

(bb) "Independent Protection Layer (IPL)" means a safeguard that reduces the likelihood or consequences of a major incident through the application of devices, systems, or actions and is (1) independent of an initiating cause and (2) independent of other IPLs. Independence ensures that an initiating event does not affect the function of an IPL and that failure in any one layer does not affect the function of any other layer.

(cc) "Inherent safety" means an approach to safety that focuses on eliminating or reducing the hazards associated with a set of conditions. A process is inherently safer if it reduces or eliminates the hazards associated with materials or operations used in the process, and this reduction or elimination is permanent and inseparable from the material or operation. A process with reduced hazards is described as inherently safer

compared to a process with only passive, active, and procedural safeguards. The process of identifying and implementing inherent safety in a specific context is known as inherently safer design.

(1) "First Order Inherent Safety measure" is a measure that eliminates a hazard. Changes in the chemistry of a process that eliminate the hazard(s) of the chemicals used or produced are usually considered First Order Inherent Safety measures; for example, by substituting a flammable chemical with an alternative chemical that can serve the same function but with lower vapor pressure and narrower flammable range.

(2) "Second Order Inherent Safety measure" is a measure that reduces the severity of a hazard or the likelihood of a release without the use of add-on safety devices. Changes in process variables to minimize, moderate and simplify a process are usually considered Second Order Inherent Safety measures; for example, redesigning a high-pressure, high-volume, and high-temperature system to operate at lower temperatures, volumes, and pressures.

(dd) "Initiating cause" means an operational error, mechanical failure, or other internal or external event that is the first event in an incident sequence and marks the transition from a normal situation to an abnormal situation.

(ee) "Injury" means any effect on a human that results either from direct exposure to toxic concentrations; radiant heat; or overpressures from accidental releases or from the direct consequences of a vapor cloud explosion (such as flying glass, debris, and other projectiles) from an accidental release and that requires medical treatment or hospitalization.

(ff) "Interested parties" means those residents, workers, students and others who would be potentially affected by an accidental or catastrophic release.

(gg) "Isolate" means to cause equipment to be removed from service and completely protected against the inadvertent release or introduction of material or energy by such means as blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; implementing a double block and bleed system; or blocking or disconnecting all mechanical linkages.

(hh)

(1) "Major change" means: ~~(1)~~(A) introduction of a new process, or ~~(2)~~(B) new process equipment, or new regulated substance that

results in any operational change outside of established safe operating limits; or ~~(3)~~(C) any alteration in a process, process equipment, or process chemistry that introduces a new hazard or increases an existing hazard. This definition shall not apply to Article 7.

(2) "Major change" for the purposes of Article 7 means: (A) introduction of a new process, or (B) introduction of new process equipment, or (C) introduction of a new highly hazardous material that results in any operational change outside of established safe operating limits, or (D) any alteration in a process, process equipment, or process chemistry that results in any operational change outside of established safe operating limits. An alteration in process or process equipment does not include a replacement in kind.

For the purposes of Article 7 (program 4), an introduction of new process equipment or alteration in process or process equipment must result in an operational change outside of established safe operating limits to be considered a major change.

(ii) "Major incident" means an event within or affecting a process that causes a fire, explosion or release of a highly hazardous material, and has the potential to result in death or serious physical harm (as defined in Labor Code Section 6432(e)), or results in an officially declared public shelter-in-place, or evacuation order.

(jj) "Mechanical integrity" means the process of ensuring that process equipment is fabricated from the proper materials of construction and is properly installed, maintained, and replaced to prevent failures and accidental releases.

(kk) "Medical treatment" means treatment, other than first aid, administered by a physician or registered professional personnel under standing orders from a physician.

(ll) "Mitigation or mitigation system" means specific activities, technologies, or equipment designed or deployed to capture or control substances upon loss of containment to minimize exposure of the public or the environment. Passive mitigation means equipment, devices, or technologies that function without human, mechanical, or other energy input. Active mitigation means equipment, devices, or technologies that need human, mechanical, or other energy input to function.

(mm) "Modified stationary source" means a stationary source which has undergone an addition or change which qualifies as a "major change" as defined in (hh) of this section.

(nn) "NAICS" means the North American Industry Classification System.

(oo) "NFPA" means the National Fire Protection Association.

(pp) "Natural gas processing plant" (gas plant) means any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both, classified as North American Industrial Classification System (NAICS) code 211112 (previously Standard Industrial Classification (SIC) code 1321).

(qq) "New stationary source" means a stationary source that now has a covered process that is not currently in the CalARP program.

(rr) "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.

(ss) "OSHA" means the Occupational Safety and Health Administration.

(tt) "Owner or operator" means any person who owns, leases, operates, controls, or supervises a stationary source.

(uu) "Part 68" means Part 68 of Subpart A of Subchapter C of Chapter I of Title 40 of CFR.

(vv) "Petroleum refinery" means a stationary source engaged in activities set forth in North American Industry Classification System (NAICS) code 324110.

(ww) "Population" means the public.

(xx) "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 7.

(yy) "Process" for purposes of Article 7, means petroleum refining activities involving a ~~highly hazardous material~~ regulated substance, including use, storage, manufacturing, handling, piping, or on-site movement. For the

purposes of this definition, any group of vessels that are interconnected, or separate vessels that are located such that an incident in one vessel could affect any other vessel, shall be considered a single process. Any petroleum refining activities involving a highly hazardous material shall be considered part of a process. Utilities and safety related devices shall be considered part of the process if, in the event of an unmitigated failure or malfunction, they could potentially contribute to a major incident. This definition includes processes under partial or unplanned shutdowns. Ancillary administrative and support functions, including office buildings, laboratories, warehouses, maintenance shops, and change rooms are not considered processes under this definition.

(zz) "Process equipment" for purposes of Article 7, means equipment, including but not limited to: pressure vessels, rotating equipment, piping, instrumentation, process control, safeguard, except procedural safeguards, or appurtenance related to a process.

(aaa) "Process safety hazard" means a characteristic of a process that, if unmitigated, has the potential to cause a fire, explosion, or release of a highly hazardous material which could result in death or serious physical harm or a major incident.

(bbb) "Process safety culture" means a combination of group values and behaviors that reflect whether there is a collective commitment by leaders and individuals to emphasize process safety over competing goals in order to ensure protection of people and the environment.

(ccc) "Process safety performance indicators" means measurements of the facility's activities and events that are used to evaluate the performance of process safety systems.

(ddd) "Produced water" means water extracted from the earth from an oil or natural gas production well, or that is separated from oil or natural gas after extraction.

(eee) "Public" means any person except employees or contractors at the stationary source.

(fff) "Public receptor" means offsite residences, institutions (e.g., schools, hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxic concentrations, radiant heat, or overpressure, as a result of an accidental release.

(ggg) "Qualified operator" for the purposes of Article 7 means a person designated by the owner or operator, who by fulfilling the requirements of the training program defined in Section 5110.7, has demonstrated the ability to safely perform all assigned duties.

(hhh) "Qualified person" means a person who is qualified to attest, at a minimum to: (1) the validity and appropriateness of the process hazard analyses (PHA) performed pursuant to Section 5100.2; (2) the completeness of a risk management plan; and (3) the relationship between the corrective steps taken by the owner or operator following the PHAs and those hazards which were identified in the analyses.

(iii) "Qualified position" means a person occupying a position who is qualified to attest, at a minimum to: (1) the validity and appropriateness of the PHA performed pursuant to Section 5100.2; (2) the completeness of a risk management plan; and (3) the relationship between the corrective steps taken by the owner or operator following the PHAs and those hazards which were identified in the analyses.

(jjj) "Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)" for purposes of Article 7 means engineering, operation, or maintenance activities based on codes, standards, technical reports or recommended practices published by the American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American Society of Mechanical Engineers (ASME), American Society of Testing and Materials (ASTM), National Fire Protection Association (NFPA), Instrument Society of America (ISA), or other standard-setting organizations. RAGAGEP does not include standards or guidelines developed for internal use by the owner or operator.

(kkk) "Regulated substance" means any substance, unless otherwise indicated, listed in Section 5130.6 of this chapter.

(lll) "Replacement in kind" means a replacement that satisfies the design specifications.

(mmm) "Retail facility" means a stationary source at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program.

(nnn) "Revalidation" means a critical review of a hazard review or a process hazard analysis (PHA) with qualified team members of the most recent hazard review or PHA studies to verify that past studies remain valid and

that changes made to the covered process are properly assessed. This critical review is to ensure that hazards are well understood, and existing safeguards are properly identified, past recommendations have been addressed, the overall risk ranking of each scenario is accurate, and relevant incidents and near misses at the stationary source and industry are evaluated. For situations when past studies cannot be readily revalidated, a new complete hazard review or PHA may be warranted.

(ooo) "RMP" means the risk management plan as described by the component elements identified in Article 3 of this chapter.

(ppp) "Safeguard" means a device, system, or action designed and maintained to interrupt the chain of events or mitigate the consequences following an initiating cause.

(1) "Passive Safeguards" means minimizing the hazard through process and equipment design features that reduce either the frequency or consequence of the hazard without the active functioning of any device; for example, by providing a diked wall around a storage tank of flammable liquids.

(2) "Active Safeguards" means using controls, alarms, safety instrumented systems, and mitigation systems to detect and respond to deviations from normal process operations; for example, by using a pump that is shut off by a high-level switch in the downstream tank when the tank is 90% full.

(3) "Procedural Safeguards" means using policies, operating procedures, training, emergency response and other administrative approaches to prevent incidents or to minimize the effects of an incident. Examples include hot work procedures and permits and emergency response procedures implemented by employees.

(qqq) "Safety instrumented systems" means systems designed to achieve or maintain safe operation of a process in response to an unsafe process condition.

(rrr) "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. Transportation includes, but is not limited to, transportation subject to oversight or regulations under Part 192, 193, or 195 of Title 49 of CFR, or a state natural gas or hazardous liquid program for which the state has in effect a certification to DOT under Section 60105 of Title 49 of USC. A stationary source does not include naturally occurring hydrocarbon reservoirs. Properties shall not be considered contiguous solely because of a railroad or pipeline right-of-way.

(sss) "Temporary pipe or equipment repair" means a repair of an active or potential leak from process piping or equipment. This definition includes active or potential leaks in utility piping or utility equipment that could affect a process and that could result in a major incident.

(ttt) "Threshold quantity" means the quantity specified for a regulated substance pursuant to Section 5130.6 and determined to be present at a stationary source as specified in Section 5130.2 of this chapter.

(uuu) "Trade secret" means trade secrets as defined in Section 6254.7 of Subdivision (d) of the Government Code and Section 1060 of the Evidence Code and includes information submitted to a Unified Program Agency which has been designated by the stationary source as trade secret and which shall not be released by the UPA except to authorized officers and employees of other governmental agencies, and only in connection with the official duties of that officer or employee pursuant to any law for the protection of health and safety. Trade secret information is to be handled pursuant to Section 25538 of HSC.

(vvv) "Turnaround" means a planned process shutdown for the purpose of repair, maintenance, process modification, equipment upgrade or other significant process activity. This definition does not apply to Article 7.

(www) "Turnaround" for purposes of Article 7 means planned total or partial shutdown of a petroleum refinery process unit or plant to perform maintenance, overhaul or repair of a process and process equipment, and to inspect, test and replace process materials and equipment. Turnaround does not include unplanned shutdowns that occur due to emergencies or other unexpected maintenance matters in a process unit or plant. Turnaround also does not include routine maintenance, where routine maintenance consists of regular, periodic maintenance on one or more pieces of equipment at a refinery process unit or plant that may require shutdown of such equipment.

(xxx) "Typical meteorological conditions" means the temperature, wind speed, cloud cover, and atmospheric stability class, prevailing at the site based on data gathered at or near the site or from a local meteorological station.

(yyy) "Unified Program Agency (UPA)" means the local agency, pursuant to HSC Section 25501, responsible to implement the CalARP Program.

(zzz) "Utility" for purposes of Article 7, means a system that provides energy or other process-related services to enable the safe operation of a petroleum refinery process. This definition includes electrical power, fire water systems, steam, instrument power, instrument air, nitrogen, and carbon dioxide.

(aaaa) "Vessel" means any reactor, tank, drum, barrel, cylinder, vat, kettle, boiler, pipe, hose, or other container.

(bbbb) "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 5080.2(a) of this chapter.

NOTE: Authority cited: ~~Section 8585, Government Code; and~~ Sections 25531, 25533, and 25534.05, Health and Safety Code. Reference: ~~Section 8585, Government Code; and~~ Sections 25501, 25531.2, and 25532, Health and Safety Code; and Section 68.3, Part 68, Title 40, Code of Federal Regulations.

Article 7. Program 4 Prevention Program

§ 5110.1. Applicability.

(a) This Article shall apply to processes within petroleum refineries.

(b) ~~All processes of the petroleum refinery are covered except~~ This article shall not apply to processes at plant laboratories or laboratories that are under the supervision of a technically qualified individual as defined in section 720.3(ee) of 40 CFR. This exemption does not apply to specialty chemical production; manufacture, processing or use of substances in pilot plant scale operations; and activities conducted outside the laboratory.

NOTE: Authority cited: ~~Section 8585, Government Code; and~~ Sections 25531, 25533, and 25534.05, Health and Safety Code. Reference: ~~Section 8585, Government Code; and~~ Sections 25531, 25531.2 and 25534, Health and Safety Code.

§ 5110.13. Employee Participation.

(a) In consultation with employees and employee representatives, the owner or operator shall develop, implement and maintain a written plan to effectively provide for employee participation in Accidental Release Prevention elements, as required by this Article. The plan shall include provisions that provide for the following:

(1) Effective participation by affected operating and maintenance employees and employee representatives, throughout all phases, in performing PHAs, DMRs, HCAs, MOCs, MOOCs, Process Safety Culture Assessments (PSCAs), Incident Investigations, SPAs, and PSSRs;

(2) Effective participation by affected operating and maintenance employees and employee representatives, throughout all phases, ~~of~~ in the development, training, implementation and maintenance of the Accidental Release Prevention elements required by this Article.

(3) Access by employees and employee representatives to all documents or information developed or collected by the owner or operator pursuant to this Article, including information that might be subject to protection as a trade secret;

(4) With respect to employee participation in Accidental Release Prevention element activities required by this Article, the owner or operator will allow for "effective participation" by employees in such activities if it provides advance notice of each such Accidental Release Prevention element activity and considers input provided by individuals participating in each such activity, including the employee representative. If the requisite advance notice is provided as specified above, owner or operator shall not be required to delay any Accidental Release Prevention element activity due to the failure by a union, or employees in the absence of a union, to select an employee representative, or the failure of a selected employee representative to participate in the noticed activity. Nothing in this subsection shall be construed to require an owner or operator to accept recommendations or findings of employee representatives.

(b) ~~An authorized collective bargaining agent may select employee(s) to participate in overall Accidental Release Prevention program development and implementation planning and for employee(s) to participate in each team-based activity pursuant to this Article~~. The written employee-participation plan will determine how employees are selected to participate in overall Accidental Release Prevention program development and implementation planning and to participate in Accidental Release Prevention teams and other activities, pursuant to this Article. Any such employees shall be on-site and qualified for the task for which they are selected and shall be subject to all provisions of 5110.13(a).

(c) Where employees are not represented by an authorized collective bargaining agent, the owner or operator shall establish effective procedures in consultation with employees for the selection of employee representatives.

(d) Nothing in this subsection shall preclude the owner or operator from requiring an employee or employee representative to whom information is made available under subsection 5110.13(a)(3) to enter into a confidentiality agreement prohibiting him or her from disclosing such information.

NOTE: Authority cited: ~~Section 8585, Government Code; and~~ Sections 25531, 25533, and 25534.05, Health and Safety Code. Reference: ~~Section 8585, Government Code;~~ Section 25531 and 25531.2, Health and Safety Code; and Section 68.83, Part 68, Title 40, Code of Federal Regulations.

§ 5110.16. Hierarchy of Hazard Control Analysis.

(a) The owner or operator shall conduct an HCA for all existing processes. The HCA for existing processes shall be performed in accordance with the following schedule, and may be performed in conjunction with the PHA schedule:

(1) No less than 50% of existing processes within three (3) years of the effective date of this Article;

(2) Remaining processes within five (5) years of the effective date of this Article.

(b) The owner or operator shall also conduct an HCA in a timely manner in the following instances:

(1) For all PHA recommendations for each scenario that identifies the potential for a major incident;

(2) Whenever a major change is proposed at a facility, the owner or operator shall conduct an HCA as part of a Management of Change review required by section 5110.9;

(3) When a major incident occurs, the owner or operator shall complete an HCA on the recommendations of the incident investigation report required by section 5110.12; and

(4) During the design and review of new processes, new process units, and new facilities, and their related process equipment. An HCA report prepared for this purpose shall be provided to the UPA. The UPA shall make these HCA reports available to the public by posting them on the UPA's website within 30 calendar days, with appropriate protections for trade secret information.

(c) All HCAs shall be updated consistent with the requirements of this section at least once every five years, in conjunction with the PHA schedule.

(d) An HCA shall be performed, updated, and documented by a team with expertise in engineering and process operations and the team shall include at least one operating employee who currently works on the process and has experience and knowledge specific to the process being evaluated. The team shall also include one member knowledgeable in the HCA method being used. The owner or operator shall provide for employee participation in this process, pursuant to section 5110.13. As necessary, the team shall consult with individuals with expertise in damage mechanisms, process chemistry, and control systems.

(e) The HCA team shall:

(1) Include all risk-relevant data for each process or recommendation, including incident investigation reports pursuant to section 5110.12;

(2) Identify, characterize and prioritize each process safety hazard.

(3) Identify, analyze, and document all inherent safety measures and safeguards (or where appropriate, combinations of measures and safeguards) in an iterative manner to reduce each hazard to the greatest extent feasible. Identify, analyze, and document relevant, publicly available information on inherent safety measures and safeguards. ~~This information shall include inherent safety measures and safeguards that have been: (A) achieved in practice by for the petroleum refining industry and related industrial sectors; or, (B) required or recommended for the petroleum refining industry, and related industrial sectors, by a federal or state agency, or local California agency, in a regulation or report.~~

(f) For each process safety hazard identified using the analysis required by subdivision (e), the team shall develop written recommendations in the following sequence and priority order. ~~to eliminate hazards to the greatest extent feasible using first order inherent safety measures. The team shall develop written recommendations to reduce any remaining hazards to the greatest extent feasible using second order inherent safety measures. If necessary, the team shall also develop written recommendations to address any remaining risks in the following sequence and priority order:~~

The HCA team shall consider all process safety hazards that may be impacted by a particular safety measure or safeguard and shall select those safety measures or safeguards that, in the team's judgment, are most effective at reducing all such process safety hazards.

(1) Eliminate hazards to the greatest extent feasible using first order inherent safety measures;

(2) Reduce any remaining hazards to the greatest extent feasible using second order inherent safety measures;

(~~1~~3) Effectively reduce remaining risks using passive safeguards;

(~~2~~4) Effectively reduce remaining risks using active safeguards; and

(~~3~~5) Effectively reduce remaining risks using procedural safeguards.

(g) The HCA team shall complete an HCA report within 90 calendar days following development of the recommendations. The report shall include:

(1) A description of the composition, experience, and expertise of the members of the team that performed the HCA;

(2) A description of the methodology used by the team;

(3) A description of each process safety hazard analyzed by the team, pursuant to subdivision (e)(2) above;

(4) A description of the inherent safety measure(s) and safeguards analyzed by the team, pursuant to subdivision (e)(3) above; ~~and~~

(5) The rationale for the inherent safety measures and safeguards recommended by the team for each process safety hazard, pursuant to subsection (f)~~.~~;and

(6) The rationale for not recommending any inherent safety measures and safeguards analyzed by the team and identified pursuant to subsection (e)(3).

(h) The owner or operator shall follow the corrective action work process documented in subsections 5110.19(d) and (e) when resolving the HCA team's finding and recommendations determining corrective action for implementation, tracking to completion, and documentation of closeout.

(i) The owner or operator shall retain all HCA reports for the life of each process.

NOTE: Authority cited: ~~Section 8585, Government Code; and~~ Sections 25531, 25533, and 25534.05, Health and Safety Code. Reference: ~~Section 8585, Government Code; and~~ Sections 25531, 25531.2, 25534, 25535 and 25535.1, Health and Safety Code.

Article 9. Regulated Substances for Accidental Release Prevention

§ 5130.6. List of Substances.

Regulated toxic and flammable substances under Section 112(r) of the federal CAA are the substances listed in Tables 1 and 2. Table 3 lists those regulated substances pursuant to Section 25532(i)(2) of HSC. Threshold quantities for listed toxic and flammable substances are specified in the tables.

NOTE: Authority cited: Sections 25531, 25533, and 25534.05, Health and Safety Code. Reference: Sections 25531.2, 25532(i)~~(2),~~ and 25543.3, Health and Safety Code; and Section 68.130, Part 68, Title 40, Code of Federal Regulations.

Table 3 State Regulated Substances List and Threshold Quantities for Accidental Release Prevention

Chemical Name	*Also on Table 1* [1]	*CAS Number*	*State Threshold quantity (lbs)*
Acetone Cyanohydrin [2]	no	75-86-5	1,000
Acetone Thiosemicarbazide	no	1752-30-3	1,000/10,000 [3]
Acrolein	yes	107-02-8	500
Acrylamide	no	79-06-1	1,000/10,000 [3]
Acrylonitrile	yes	107-13-1	10,000
Acrylyl Chloride	yes	814-68-6	100
Aldicarb	no	116-06-3	100/10,000 [3]
Aldrin	no	309-00-2	500/10,000 [3]
Allyl Alcohol	yes	107-18-6	1,000
Allylamine	yes	107-11-9	500
Aluminum Phosphide [4]	no	20859-73-8	500
Aminopterin	no	54-62-6	500/10,000 [3]
Amiton Oxalate	no	3734-97-2	100/10,000 [3]
Ammonia [5]	yes	7664-41-7	500
Aniline [2]	no	62-53-3	1,000
Antimycin A	no	1397-94-0	1,000/10,000 [3]
ANTU	no	86-88-4	500/10,000 [3]
Arsenic Pentoxide	no	1303-28-2	100/10,000 [3]
Arsenous Oxide	no	1327-53-3	100/10,000 [3]
Arsenous Trichloride	yes	7784-34-1	500
Arsine	yes	7784-42-1	100
Azinphos-Ethyl	no	2642-71-9	100/10,000 [3]

Azinphos-Methyl	no	86-50-0	10/10,000 [3]
Benzene, 1-(Chloromethyl)-4-Nitro-	no	100-14-1	500/10,000 [3]
Benzenearsonic Acid	no	98-05-5	10/10,000 [3]
Benzimidazole, 4,5-Dichloro-2-(Trifluoromethyl)-	no	3615-21-2	500/10,000 [3]
Benzotrichloride [2]	no	98-07-7	100
Bicyclo[2.2.1] Heptane-2-Carbonitrile, 5-Chloro- 6-((((Methylamino) Carbonyl)Oxy)Imino)-, (1s-(1-alpha, 2-beta, 4-alpha, 5-alpha, 6E))-.	no	15271-41-7	500/10,000 [3]
Bis(Chloromethyl) Ketone	no	534-07-6	10/10,000 [3]
Bitoscanate	no	4044-65-9	500/10,000 [3]
Boron Trichloride	yes	10294-34-5	500
Boron Trifluoride	yes	7637-07-2	500
Boron Trifluoride Compound w/ Methyl Ether (1:1)	yes	353-42-4	1,000
Bromadiolone	no	28772-56-7	100/10,000 [3]
Bromine	yes	7726-95-6	500
Cadmium Oxide	no	1306-19-0	100/10,000 [3]
Cadmium Stearate	no	2223-93-0	1,000/10,000 [3]
Calcium Arsenate	no	7778-44-1	500/10,000 [3]
Camphechlor	no	8001-35-2	500/10,000 [3]
Cantharidin	no	56-25-7	100/10,000 [3]
Carbachol Chloride	no	51-83-2	500/10,000 [3]

Carbamic Acid, Methyl-,o-(((2,4-Dimethyl-1, 3-Dithiolan-2-yl)Methylene) Amino)-.	no	26419-73-8	100/10,000 [3]
Carbofuran	no	1563-66-2	10/10,000 [3]
Carbon Disulfide	yes	75-15-0	10,000
Chlorine	yes	7782-50-5	100
Chlormequat Chloride	no	999-81-5	100/10,000 [3]
Chloroacetic Acid	no	79-11-8	100/10,000 [3]
Chloroform	yes	67-66-3	10,000
Chloromethyl Ether	yes	542-88-1	100
Chloromethyl Methyl Ether	yes	107-30-2	100
Chlorophacinone	no	3691-35-8	100/10,000 [3]
Chloroxuron	no	1982-47-4	500/10,000 [3]
Chromic Chloride	no	10025-73-7	1/10,000 [3]
Cobalt Carbonyl	no	10210-68-1	10/10,000 [3]
Cobalt, ((2,2'-(1,2-Ethanediylbis (Nitrilomethylidyne)) Bis(6-Fluorophenolato))(2-)-N,N',O,O')-.	no	62207-76-5	100/10,000 [3]
Colchicine	no	64-86-8	10/10,000 [3]
Coumaphos	no	56-72-4	100/10,000 [3]
Coumatetralyl	no	5836-29-3	500/10,000 [3]
Cresol, o-	no	95-48-7	1,000/10,000 [3]
Crimidine	no	535-89-7	100/10,000 [3]
Crotonaldehyde	yes	4170-30-3	1,000
Crotonaldehyde, (E)-	yes	123-73-9	1,000
Cyanogen Bromide	no	506-68-3	500/10,000 [3]

Cyanogen Iodide	no	506-78-5	1,000/10,000 [3]
Cyanuric Fluoride	no	675-14-9	100
Cycloheximide	no	66-81-9	100/10,000 [3]
Cyclohexylamine	yes	108-91-8	10,000
Decaborane(14)	no	17702-41-9	500/10,000 [3]
Dialifor	no	10311-84-9	100/10,000 [3]
Diborane	yes	19287-45-7	100
Diepoxybutane [2]	no	1464-53-5	500
Digitoxin	no	71-63-6	100/10,000 [3]
Digoxin	no	20830-75-5	10/10,000 [3]
Dimethoate	no	60-51-5	500/10,000 [3]
Dimethyldichlorosilane	yes	75-78-5	500
Dimethylhydrazine	yes	57-14-7	1,000
Dimethyl-p-Phenylenediamine	no	99-98-9	10/10,000 [3]
Dimethyl Sulfate [2]	no	77-78-1	500
Dimetilan	no	644-64-4	500/10,000 [3]
Dinitrocresol	no	534-52-1	10/10,000 [3]
Dinoseb	no	88-85-7	100/10,000 [3]
Dinoterb	no	1420-07-1	500/10,000 [3]
Diphacinone	no	82-66-6	10/10,000 [3]
Disulfoton [2]	no	298-04-4	500
Dithiazanine Iodide	no	514-73-8	500/10,000 [3]
Dithiobiuret	no	541-53-7	100/10,000 [3]
Emetine, Dihydrochloride	no	316-42-7	1/10,000 [3]
Endosulfan	no	115-29-7	10/10,000 [3]
Endothion	no	2778-04-3	500/10,000 [3]

Endrin	no	72-20-8	500/10,000 [3]
Epichlorohydrin	yes	106-89-8	1,000
EPN	no	2104-64-5	100/10,000 [3]
Ergocalciferol	no	50-14-6	1,000/10,000 [3]
Ergotamine Tartrate	no	379-79-3	500/10,000 [3]
Ethylenediamine	yes	107-15-3	10,000
Ethylene Fluorohydrin	no	371-62-0	10
Ethyleneimine	yes	151-56-4	500
Ethylene Oxide	yes	75-21-8	1,000
Fenamiphos	no	22224-92-6	10/10,000 [3]
Fluenetil	no	4301-50-2	100/10,000 [3]
Fluorine	yes	7782-41-4	500
Fluoroacetamide	no	640-19-7	100/10,000 [3]
Fluoroacetic Acid	no	144-49-0	10/10,000 [3]
Fluoroacetyl Chloride	no	359-06-8	10
Fluorouracil	no	51-21-8	500/10,000 [3]
Formaldehyde [5]	yes	50-00-0	500
Formetanate Hydrochloride	no	23422-53-9	500/10,000 [3]
Formparanate	no	17702-57-7	100/10,000 [3]
Fuberidazole	no	3878-19-1	100/10,000 [3]
Furan	yes	110-00-9	500
Gallium Trichloride	no	13450-90-3	500/10,000 [3]
Hydrazine	yes	302-01-2	1,000
Hydrocyanic Acid	yes	74-90-8	100
Hydrogen Chloride (gas only)	yes	7647-01-0	500
Hydrogen Fluoride	yes	7664-39-3	100

Hydrogen Selenide	yes	7783-07-5	10
Hydrogen Sulfide	yes	7783-06-4	500
Hydroquinone [6]	no	123-31-9	500/10,000 [3]
Iron, Pentacarbonyl-	yes	13463-40-6	100
Isobenzan	no	297-78-9	100/10,000 [3]
Isobutyronitrile	yes	78-82-0	1,000
Isocyanic Acid, 3,4-Dichlorophenyl Ester	no	102-36-3	500/10,000 [3]
Isodrin	no	465-73-6	100/10,000 [3]
Isophorone Diisocyanate	no	4098-71-9	100
Isopropyl Chloroformate	yes	108-23-6	1,000
Leptophos	no	21609-90-5	500/10,000 [3]
Lewisite [2]	no	541-25-3	10
Lindane	no	58-89-9	1,000/10,000 [3]
Lithium Hydride [4]	no	7580-67-8	100
Malononitrile	no	109-77-3	500/10,000 [3]
Manganese, Tricarbonyl Methylcyclopentadienyl [2]	no	12108-13-3	100
Mechlorethamine [2]	no	51-75-2	10
Mercuric Acetate	no	1600-27-7	500/10,000 [3]
Mercuric Chloride	no	7487-94-7	500/10,000 [3]
Mercuric Oxide	no	21908-53-2	500/10,000 [3]
Methacrylonitrile	yes	126-98-7	500
Methacryloyl Chloride	no	920-46-7	100
Methacryloyloxyethyl Isocyanate	no	30674-80-7	100
Methamidophos	no	10265-92-6	100/10,000 [3]

Methanesulfonyl Fluoride	no	558-25-8	1,000
Methidathion	no	950-37-8	500/10,000 [3]
Methiocarb	no	2032-65-7	500/10,000 [3]
Methomyl	no	16752-77-5	500/10,000 [3]
Methoxyethylmercuric Acetate	no	151-38-2	500/10,000 [3]
Methyl Bromide	no	74-83-9	1,000
Methyl 2-Chloroacrylate	no	80-63-7	500
Methyl Chloroformate	yes	79-22-1	500
Methyl Hydrazine	yes	60-34-4	500
Methyl Isocyanate	yes	624-83-9	500
Methyl Isothiocyanate [4]	no	556-61-6	500
Methyl Mercaptan	yes	74-93-1	500
Methylmercuric Dicyanamide	no	502-39-6	500/10,000 [3]
Methyl Phosphonic Dichloride [4]	no	676-97-1	100
Methyl Thiocyanate	yes	556-64-9	10,000
Methyltrichlorosilane	yes	75-79-6	500
Methyl Vinyl Ketone	no	78-94-4	10
Metolcarb	no	1129-41-5	100/10,000 [3]
Mexacarbate	no	315-18-4	500/10,000 [3]
Mitomycin C	no	50-07-7	500/10,000 [3]
Monocrotophos	no	6923-22-4	10/10,000 [3]
Muscimol	no	2763-96-4	500/10,000 [3]
Mustard Gas [2]	no	505-60-2	500
Nickel Carbonyl	yes	13463-39-3	1

Nicotine Sulfate	no	65-30-5	100/10,000 [3]
Nitric Acid	yes	7697-37-2	1,000
Nitric Oxide	yes	10102-43-9	100
Nitrobenzene [2]	no	98-95-3	10,000
Nitrogen Dioxide	no	10102-44-0	100
Norbormide	no	991-42-4	100/10,000 [3]
Organorhodium Complex (PMN-82-147)	no	MIXTURE	10/10,000 [3]
Ouabain	no	630-60-4	100/10,000 [3]
Oxamyl	no	23135-22-0	100/10,000 [3]
Ozone	no	10028-15-6	100
Paraquat Dichloride	no	1910-42-5	10/10,000 [3]
Paraquat Methosulfate	no	2074-50-2	10/10,000 [3]
Parathion-Methyl	no	298-00-0	100/10,000 [3]
Paris Green	no	12002-03-8	500/10,000 [3]
Pentaborane	no	19624-22-7	500
Pentadecylamine	no	2570-26-5	100/10,000 [3]
Peracetic Acid	yes	79-21-0	500
Perchloromethylmercaptan	yes	594-42-3	500
Phenol	no	108-95-2	500/10,000 [3]
Phenol, 2,2'-Thiobis(4-Chloro-6-Methyl)-	no	4418-66-0	100/10,000 [3]
Phenol, 3-(1-Methylethyl)-, Methylcarbamate	no	64-00-6	500/10,000 [3]
Phenoxarsine, 10, 10' -- Oxydi-	no	58-36-6	500/10,000 [3]
Phenyl Dichloroarsine [2]	no	696-28-6	500

Phenylhydrazine Hydrochloride	no	59-88-1	1,000/10,000 [3]
Phenylmercury Acetate	no	62-38-4	500/10,000 [3]
Phenylsilatrane	no	2097-19-0	100/10,000 [3]
Phenylthiourea	no	103-85-5	100/10,000 [3]
Phorate [2]	no	298-02-2	10
Phosacetim	no	4104-14-7	100/10,000 [3]
Phosfolan	no	947-02-4	100/10,000 [3]
Phosgene	yes	75-44-5	10
Phosmet	no	732-11-6	10/10,000 [3]
Phosphine	yes	7803-51-2	500
Phosphonothioic Acid, Methyl-, S-(2-(Bis(1-Methylethyl)Amino)Ethyl) O-Ethyl Ester. [2]	no	50782-69-9	100
Phosphorus [4]	no	7723-14-0	100
Phosphorus Oxychloride	yes	10025-87-3	500
Phosphorus Pentachloride [4]	no	10026-13-8	500
Phosphorus Trichloride	yes	7719-12-2	1,000
Physostigmine	no	57-47-6	100/10,000 [3]
Physostigmine, Salicylate (1:1)	no	57-64-7	100/10,000 [3]
Picrotoxin	no	124-87-8	500/10,000 [3]
Piperidine	yes	110-89-4	1,000
Potassium Arsenite	no	10124-50-2	500/10,000 [3]
Potassium Cyanide [4]	no	151-50-8	100
Potassium Silver Cyanide [4]	no	506-61-6	500
Promecarb	no	2631-37-0	500/10,000 [3]

Propargyl Bromide	no	106-96-7	10
Propiolactone, Beta- [2]	no	57-57-8	500
Propionitrile	yes	107-12-0	500
Propiophenone, 4-Amino-	no	70-69-9	100/10,000 [3]
Propyl Chloroformate	yes	109-61-5	500
Prothoate	no	2275-18-5	100/10,000 [3]
Pyrene	no	129-00-0	1,000/10,000 [3]
Pyridine, 4-Amino-	no	504-24-5	500/10,000 [3]
Pyridine, 4-Nitro-, 1-Oxide	no	1124-33-0	500/10,000 [3]
Pyriminil	no	53558-25-1	100/10,000 [3]
Salcomine	no	14167-18-1	500/10,000 [3]
Sarin [2]	no	107-44-8	10
Selenious Acid	no	7783-00-8	1,000/10,000 [3]
Semicarbazide Hydrochloride	no	563-41-7	1,000/10,000 [3]
Sodium Arsenate	no	7631-89-2	1,000/10,000 [3]
Sodium Arsenite	no	7784-46-5	500/10,000 [3]
Sodium Azide (Na (N3)) [4]	no	26628-22-8	500
Sodium Cacodylate	no	124-65-2	100/10,000 [3]
Sodium Cyanide (Na (CN)) [4]	no	143-33-9	100
Sodium Fluoroacetate	no	62-74-8	10/10,000 [3]
Sodium Selenate	no	13410-01-0	100/10,000 [3]
Sodium Selenite	no	10102-18-8	100/10,000 [3]
Sodium Tellurite	no	10102-20-2	500/10,000 [3]
Stannane, Acetoxytriphenyl-	no	900-95-8	500/10,000 [3]
Strychnine	no	57-24-9	100/10,000 [3]
Strychnine Sulfate	no	60-41-3	100/10,000 [3]

Sulfur Dioxide	yes	7446-09-5	500
Sulfuric Acid [7]	no	7664-93-9	1,000
Sulfur Tetrafluoride	yes	7783-60-0	100
Sulfur Trioxide [4]	yes	7446-11-9	100
Tabun [2]	no	77-81-6	10
Tellurium Hexafluoride	no	7783-80-4	100
Tetramethyllead	yes	75-74-1	100
Tetranitromethane	yes	509-14-8	500
Thallium Sulfate	no	10031-59-1	100/10,000 [3]
Thallous Carbonate	no	6533-73-9	100/10,000 [3]
Thallous Chloride	no	7791-12-0	100/10,000 [3]
Thallous Malonate	no	2757-18-8	100/10,000 [3]
Thallous Sulfate	no	7446-18-6	100/10,000 [3]
Thiocarbazide	no	2231-57-4	1,000/10,000 [3]
Thiofanox	no	39196-18-4	100/10,000 [3]
Thiosemicarbazide	no	79-19-6	100/10,000 [3]
Thiourea, (2-Chlorophenyl)-	no	5344-82-1	100/10,000 [3]
Thiourea, (2-Methylphenyl)-	no	614-78-8	500/10,000 [3]
Titanium Tetrachloride	yes	7550-45-0	100
Toluene-2,4-Diisocyanate [8]	yes	584-84-9	500
Toluene-2,6-Diisocyanate [8]	yes	91-08-7	100
Triamiphos	no	1031-47-6	500/10,000 [3]
Trichloro(Chloromethyl)Silane	no	1558-25-4	100
Trichloro(Dichlorophenyl)Silane	no	27137-85-5	500
Triethoxysilane	no	998-30-1	500
Trimethylchlorosilane	yes	75-77-4	1,000

Trimethylolpropane Phosphite	no	824-11-3	100/10,000 [3]
Trimethyltin Chloride	no	1066-45-1	500/10,000 [3]
Triphenyltin Chloride	no	639-58-7	500/10,000 [3]
Tris(2-Chloroethyl)Amine [2]	no	555-77-1	100
Valinomycin	no	2001-95-8	1,000/10,000 [3]
Vanadium Pentoxide	no	1314-62-1	100/10,000 [3]
Vinyl Acetate Monomer	yes	108-05-4	1,000
Warfarin	no	81-81-2	500/10,000 [3]
Warfarin Sodium	no	129-06-6	100/10,000 [3]
Xylylene Dichloride	no	28347-13-9	100/10,000 [3]
Zinc, Dichloro(4,4-Dimethyl-5((((Methylamino) Carbonyl)Oxy)Imino)			
Pentanenitrile)-, (T-4)-.	no	58270-08-9	100/10,000 [3]
Zinc Phosphide [4]	no	1314-84-7	500

[1] This column identifies substances which may appear on Table 1. Table 1 may have concentration limitations.

[2] Substances that failed the evaluation pursuant to Section 25532~~(g)~~(i)(2) of the HSC but remain listed pursuant to potential health impacts. The exemption in Section 5130.2(b)(1)(B) regarding portions of a process where these regulated substances are handled at partial pressures below 10 mm Hg does not apply to these substances.

[3] These extremely hazardous substances are solids. The lesser quantity listed applies only if in powdered form and with a particle size of less than 100 microns; or if handled in solution or in molten form; or the substance has an NFPA rating for reactivity of 2, 3, or 4. Otherwise, a 10,000 pound threshold applies. The exemption in Section 5130.2(b)(1)(B) regarding portions of a process where these regulated substances are handled at partial pressures below 10 mm Hg does not apply to these substances.

[4] These extremely hazardous substances are reactive solids. The exemption in Section 5130.2(b)(1)(B) regarding portions of a process where these regulated substances are handled at partial pressures below 10 mm Hg does not apply to these substances.

[5] Appropriate synonyms or mixtures of extremely hazardous substances with the same CAS number are also regulated, e.g., formalin. The listing of ammonia includes anhydrous and aqueous forms of ammonia pursuant to Section 25532~~(g)~~(i)(2).
[6] Hydroquinone is exempt in crystalline form.
[7] Sulfuric acid fails the evaluation pursuant to Section 25532~~(g)~~(i)(2) of the HSC but remains listed as a Regulated Substance only under the following conditions:
a. If concentrated with greater than 100 pounds of sulfur trioxide or the acid meets the definition of oleum. (The Table 3 threshold for sulfur trioxide is 100 pounds.) (The Table 1 threshold for oleum is 10,000 pounds.)
b. If in a container with flammable hydrocarbons (flash point < 73° F).
[8] The exemption in Section 5130.2(b)(1)(B) regarding portions of a process where these regulated substances are handled at partial pressures below 10 mm Hg does not apply to these substances.