Chapter 296-67 WAC Process Safety Management for Refineries, Part A
Discussion Draft Round 2
Date: September 24, 2018

WAC 296-67-XXXX Purpose and scope.

This part contains requirements for the prevention, elimination, and minimization of the consequences of releases of toxic, reactive, flammable, and explosive chemicals or materials in the petroleum refining industry.

WAC 296-67-XXXX Application

This Part A applies to processes within petroleum refineries. This regulation supersedes chapter 296-67 WAC Part B, with respect to petroleum refineries.

WAC 296-67-XXXX Definitions.

Affected employee. Anyone who controls, manages, or performs job tasks in or near a process. The term, "affected employee" includes, but is not limited to:

(a) Maintenance employees and their representatives;
(b) Operations employees and their representatives;
(c) Contract employees and their representatives; and
(d) Laboratory employees who perform sampling tasks within a process.

Change. Any alteration in process chemicals, technology, procedures, process equipment, facilities or organization that could affect a process. A change does not include replacement-in-kind.

Damage Mechanism. The mechanical, chemical, physical, microbiological, or other mechanism that results in equipment or material degradation.

Employee Representative. 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 is to be construed broadly, and may include the local union, the international union, or a refinery or contract employee designated by these parties, such as the safety and health committee representative at the site.

Facility. The plants, units, buildings, containers or equipment that contain(s) or include(s) a process.

Feasible. 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. Economic factors must not be the sole basis in determining feasibility.

Flammable gas. See definition of flammable gas in WAC 296-901-14024 (B.2); Appendix B – Physical hazard criteria.

Flammable liquid. See definition of flammable liquid in WAC 296-901-14024 (B.6), Appendix B – Physical hazard criteria.

Hierarchy of Hazard Controls. Hazard 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.

Hazardous Chemical or Material. A substance possessing toxic, reactive, flammable, or explosive properties.

Hot Work. Work involving electric or gas welding, cutting, brazing, or any similar heat, flame, or spark-producing procedures or operations, including the use of non-intrinsically-safe equipment.

Human Factors. The design of machines, operations and work environments such that they closely match human capabilities, limitations and needs. Human factors include:

(a) Environmental factors;

(b) Organizational and job factors;

(c) Human and individual characteristics such as fatigue, that can affect job performance;

(d) Process safety;

(e) Health and safety, and

(f) Potentially adverse consequences created by the design of equipment or systems within a process.

Independent Protection Layers (IPLs). Safeguards that reduce the likelihood or consequences of a process safety incident through the application of devices, systems or actions. IPLs are independent of an initiating cause and independent of other IPLs. Independence ensures that an initiating cause does not affect the function of an IPL and that failure in any one layer does not affect the function of any other layer.

Inherent Safety. 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 eliminates or reduces the hazards associated with materials or operations used in the process, and this elimination or reduction is permanent and inseparable from the material or operation. A process with eliminated or 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:

(a) First Order Inherent Safety Measure. A measure that eliminates a hazard. Changes in the chemistry of a process that eliminate the hazards of a chemical are usually considered first order inherent safety measures; for example, by substituting a toxic chemical with an alternative chemical that can serve the same function but is less toxic.

(b) Second Order Inherent Safety Measure. A measure that effectively reduces the severity of a hazard or the likelihood of a release. Changes in process variables to minimize, moderate and simplify a process are usually considered second order inherent safety measures; for example, by redesigning a high-pressure, high-temperature system to operate at ambient temperatures and pressures.

Initiating Cause. An operational error, mechanical failure or other internal or external event that is the first event in an incident sequence, which may also mark the transition from a normal situation to an abnormal situation.

Isolate. To completely protect workers against the release or introduction of hazardous material or energy by such means as:

(a) Blanking, inerting, or blinding;

(b) Misaligning or removing sections of lines, pipes, or ducts;

(c) Implementing a double block and bleed system; or

(d) Blocking or disconnecting all mechanical linkages so that the process can continue to operate or remain pressurized while discrete sections of the facility are taken out of service for maintenance or inspection.

Leading Indicators. Predictive metrics of equipment, written procedures, training, employee collaboration, or other best practices used to identify potential and recurring deficiencies.

Lagging Indicators. Retrospective metrics of equipment, written procedures, training, employee collaboration, or other practices identified as requiring corrective action.

Major Change. Any of the following:

(a) Introduction of a new process, new process equipment, or new hazardous material;

(b) Any operational change outside of established safe operating limits; or,

(c) Any alteration that introduces a new process safety hazard or worsens an existing process safety hazard.

Must. Must means mandatory.

Outage. Any occasion, including scheduled turnarounds, during which a process or part of a process is taken off stream. Outages also include the reduction of temperatures and/or pressures within equipment, and total or partial shutdowns of a process to:

(a) Perform maintenance;

(b) Overhaul or repair of a process and process equipment; or

(c) Perform routine and non-routine maintenance, where such maintenance consists of regular, periodic maintenance on one or more pieces of equipment that may require shutdown of such equipment.

Preventive Maintenance. Preventive maintenance tasks are those activities that are carried out when process equipment is shut down.

Process. Any activity involving a hazardous chemical or material, including:

(a) Use;
(b) Storage;
(c) Manufacturing;
(d) Handling;
(e) Piping;
(f) Release mitigation;
(g) Utilities;
(h) The on-site movement of such chemicals, or combination of these activities; or
(i) Any equipment that is interconnected, that could be involved in a potential release.

This definition excludes ancillary administrative and support functions, including office buildings, labs, warehouses, maintenance shops, and change rooms.

Process Equipment. Equipment, including but not limited to pressure vessels, rotating equipment, piping, instrumentation, process control, or appurtenances, related to a process.

Process Safety Culture. A combination of group values and behaviors that reflects whether there is a collective commitment by organizational leadership to emphasize process safety over competing goals, in order to ensure the protection of employees.

Process Safety Hazard. A hazard of a process that has the potential for causing a process safety incident or death or serious physical harm.

Process Safety Incident. A near miss, unplanned release, process equipment failure, or other event within or affecting a process that could cause a fire, explosion, or release of a hazardous chemical or material.

Process Safety Management (PSM). The application of management systems to ensure the safety of workers who interface with processes.

Process Safety Performance Indicators. Measurements of the refinery's activities and events that are used to evaluate the performance of process safety systems.

Qualified. Any employee, who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve, collaborate, or resolve problems relating to the subject matter, the work, or the project.

Recognized and Generally Accepted Good Engineering Practices (RAGAGEP). Engineering, operation or maintenance activities established in codes, standards, technical reports or recommended practices, and published by recognized and generally accepted organizations such as 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), and Instrument Society of America (ISA). RAGAGEP does not include standards, guidelines or practices developed for internal use by the employer.

Replacement-in-kind. A replacement that satisfies the design specifications of the item it is replacing.

Safeguard. A device, system or action designed to interrupt the chain of events or mitigate the consequences following an initiating cause. Safeguards include:

(a) Passive Safeguards: Process or equipment design features that minimize a hazard by reducing either its frequency or consequence, without the active functioning of any device; for example, a diked wall around a storage tank of flammable liquids.

(b) Active Safeguards: Controls, alarms, safety instrumented systems and mitigation systems that are used to detect and respond to deviations from normal process operations; for example, a pump that is shut off by a high-level switch.

(c) Procedural Safeguards: Policies, operating procedures, training, administrative checks, emergency response and other management approaches used to prevent incidents or to minimize the effects of an incident. Examples include hot work procedures and emergency response procedures.

Safety System. Engineered systems designed to achieve or maintain safe operation of a process in response to an unsafe process condition.

Temporary Pipe or Equipment Repair. A temporary 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, and flange or valve packing leaks that could result in a process safety incident.

Toxic. See definition of "toxic" in WAC 296-901-14022 (A.1); Appendix A – Health hazard criteria.

Utility. A system that provides energy or other process-related services to enable the safe operation of a refinery process. This definition includes water, steam and asphyxiants, such as nitrogen and carbon dioxide, when used as part of a process, fire suppression, emergency washing, and hazard mitigation equipment.

WAC 296-67-XXXX Process safety management program.

(1) The employer must designate the refinery manager as the person with authority and responsibility for compliance with this section.

(2) The employer must develop, implement, and maintain an effective written process safety management (PSM) program, which must be reviewed and updated at least once every three years.

(3) The employer must develop, implement, and maintain an organizational chart that identifies management positions responsible for implementing the PSM Program elements required by this section.

(4) The employer must develop, implement and maintain an effective program to track, document, and assess leading and lagging factors against process safety performance indicators.

WAC 296-67-XXXX Employee collaboration.

(1) In consultation with employees and employee representatives, the employer must develop, implement, and maintain a written plan to effectively provide for employee collaboration in all PSM elements. The plan must include at least the following:

(a) Effective collaboration by affected operating and maintenance employees, throughout all phases, in performing:

(i) Process hazard analyses (PHAs);
(ii) Damage mechanism reviews (DMRs);
(iii) Hierarchy of hazard controls analyses (HCAs);
(iv) Change management;
(v) Process safety culture assessment (PSCAs),
(vi) Incident investigations;
(vii) Safeguard protection analyses (SPAs); and
(viii) Process safety startup reviews (PSSRs).

(b) Effective collaboration by affected employees and employee representatives, throughout all phases, in the development, training, implementation, and maintenance of the PSM elements required by this part; and,

(c) Access by employees and employee representatives to all documents or information developed or collected by the employer, including information that might be subject to protection as a trade secret.

(2) Authorized collective bargaining agents may select employee(s) to engage in overall PSM program development and implementation planning; and employee(s) to participate in PSM teams and other activities, pursuant to this part.

(3) Where employees are not represented by an authorized collective bargaining agent, the employer must establish effective procedures in consultation with affected employee(s) for the selection of employee representatives.

(4) Within ninety calendar days of the effective date of this part, the employer, in consultation with employees and employee representatives, must develop, implement, and maintain the following:

(a) Effective Stop Work procedures that ensure:

(i) The authority of all affected employees, including employees of contractors, to refuse or delay the performance of a task that they believe could reasonably result in serious physical harm or death;

(ii) The authority of all affected employees, including employees of contractors, to recommend the qualified operator in charge of a unit that an operation or process be partially or completely shut-down, based on a process safety hazard;

(iii) The authority of the qualified operator in charge of a unit to partially or completely shut down an operation or process, based on a process safety hazard; and

(iv) Employees who exercise stop work authority as described in this part are protected from intimidation, retaliation, or discrimination.

(b) Effective procedures to ensure the right of all employees, including employees of contractors, to anonymously report hazards. The employer must respond in writing within thirty calendar days to written hazard reports submitted by employees, employee representatives, contractors, employees of contractors and contractor employee representatives. The employer must prioritize and promptly respond to and correct hazards that present the potential for death and serious physical harm. If the employer determines that an anonymous report does not constitute a hazard, or that

the hazard is being corrected by some other means, a written response must be prepared and made available that provides this information to affected employees.

(5) The employer must document the following:

(a) Recommendations to partially or completely shut down an operation or process, pursuant to **subsection XXXX**;

(b) The partial or complete shutdown of an operation or process, pursuant to **subsection XXXX**; and

(c) Written reports of hazards, and the employer's response, pursuant to **subsection XXXX**.

WAC 296-67-XXXX Process safety information.

(1) The employer must develop, implement, and maintain a compilation of written process safety information (PSI) before conducting any:

(a) Process hazard analysis (PHA);
(b) Hierarchy of hazard controls analysis (HCA);
(c) Safeguard protection analysis (SPA); or
(d) Damage mechanism review (DMR).

The compilation of written PSI must be sufficient to enable the employer and employee involved in operating or maintaining a process to identify and understand the hazards posed by the process.

(2)The PSI must include accurate, verified, and complete information pertaining to the following:

(a) The hazards of hazardous materials used in or produced by the process;
(b) The technology of the process;
(c) Process equipment used in the process; and,
(d) Results of previous DMRs.

(3) The employer must provide for employee collaboration, pursuant to **section XXXX**. The PSI must be made available to all employees and relevant PSI must be made available to affected

employees of contractors. Information pertaining to the hazards of the process must be effectively communicated to all affected employees.

(4) Information pertaining to the hazardous chemicals or materials used in, present in, or produced by the process, must include at least the following:

(a) Toxicity information; including acute and chronic health hazards;
(b) Permissible exposure limits in accordance with WAC 296-841-20025;
(c) Physical data;
(d) Corrosion data
(e) Temperature, thermal and chemical stability data;
(f) Reactivity data;
(g) Hazardous effects of incompatible mixtures that could foreseeably occur; and
(h) Process-specific damage mechanisms.

(5) Information pertaining to the technology of the process must include at least the following:

(a) A block flow diagram or simplified process flow diagram;
(b) Process chemistry;
(c) Maximum intended inventory;
(d) Safe upper and lower limits for process variables, such items as temperatures, pressures, flows, levels, and compositions; and
(e) The consequences of deviations, including chemical mixing and reactions that may affect the safety and health of employees.

(6) Information pertaining to the equipment in the process must include at least the following:

(a) Materials of construction;
(b) Piping and instrument diagrams (P&IDs);
(c) Electrical classification;
(d) Relief system design and design basis;
(e) Ventilation system design;
(f) Design codes and standards employed, including design conditions and operating limits;

(g) Material and energy balances for processes built after September 1, 1992;
(h) Safety systems, such as interlocks and detection and suppression systems;
(i) Electrical supply and distribution systems; and
(j) Results of prior damage mechanism reviews (DMRs).

(7) The employer must document that process equipment complies with recognized and generally accepted good engineering practices (RAGAGEP), where RAGAGEP has been established for that process equipment, or with more protective internal practices that ensure safe operation.

(8) If the employer installs new process equipment for which no RAGAGEP exists, the employer must determine and document that the equipment is designed, maintained, inspected, tested and operating in a safe manner.

(9) If existing process equipment was designed and constructed in accordance with codes, standards or practices that are no longer in general use, the employer must determine and document that the process equipment is designed, installed, maintained, inspected, tested and operating in a safe manner for its intended purpose.

Note: Safety Data Sheets meeting the requirements of WAC 296-901-14014 may be used to comply with this requirement to the extent they contain the information required by this section.

WAC 296-67-XXXX Hazard analyses.

(1) Process hazard analysis.

(a) The employer must perform and document an effective Process Hazard Analysis (PHA) appropriate to the complexity of each process, in order to identify, evaluate and control hazards associated with each process. All initial PHAs for processes not covered by chapter 296-67 WAC, must be completed within three years of the effective date of this chapter. PHAs performed in accordance with the requirements of WAC 296-67-017 must satisfy the initial PHA requirements of this chapter. All modes of operations pursuant to **subsection XXXX** must be covered by the PHA.

(b) The employer must determine and document the priority order for conducting PHAs based on the extent of process hazards, the number of potentially affected employees, the age of the process and the process operating history. The employer must use at least one of the following methodologies:

(i) What-If;
(ii) Checklist;
(iii) What-If/Checklist;
(iv) Hazard and Operability Study (HAZOP);
(v) Failure Mode and Effects Analysis (FMEA);
(vi) Fault Tree Analysis; or
(vii) Other PHA methods recognized by engineering organizations or governmental agencies.

(c) The PHA must address:

(i) The hazards of the process;

(ii) Previous publicly documented major incidents in the petroleum refinery and petrochemical industry sectors that are relevant to the process;

(iii) DMR reports that are applicable to the process units, pursuant to **section XXXX**;

(iv) HCA reports that are applicable to the process units, pursuant to **section XXXX**;

(v) Potential consequences of failures of process equipment;

(vi) Facility siting, including the placement of processes, equipment, buildings, employee occupancies and work stations, in order to effectively protect employees from process safety hazards;

(vii) Human Factors, pursuant to **section XXXX**;

(viii) A qualitative evaluation of the types, severity and likelihood of possible incidents that could result from a failure of the process or of process equipment;

(ix) The potential effects of external events, including seismic events, if applicable;

(x) The findings of incident investigations relevant to the process, pursuant to **section XXXX**;

(xi) A review of applicable Management of Change (MOCs) documents completed since the last PHA, pursuant to **section XXXX**; and

(xii) Engineering and administrative controls associated with the process.

(d) The PHA must be performed by a team with expertise in engineering and process operations, and must include at least one refinery operating employee who currently works in, or provides training in the unit, and who has experience and knowledge specific to the process being evaluated. The team must also include one member with expertise in the specific PHA methodology being used. The employer must provide for employee collaboration pursuant to **section XXXX**. As necessary, the team must consult with individuals with expertise in damage mechanisms, process chemistry, Safeguard Protection Analysis, control systems.

(e) The team must document its findings and recommendations in a PHA report, which must be available in the respective work area for review by any affected employees working in that area.

(f) The PHA report must include:

(i) The methodologies, analyses and factors considered by the PHA team;

(ii) The findings of the PHA team; and

(iii) The PHA team's recommendations, including additional safeguards to address any deficiencies identified by the SPA.

(g) The employer must make the report available to affected employees whose work assignments are in the petroleum refinery and who may be affected by the findings and recommendations.

(h) At least every five years, the written PHA must be updated and revalidated in accordance with the requirements of this section to ensure that the PHA is consistent with the current process.

(2) Safeguard protection analysis.

(a) For each scenario in the PHA that identifies the potential for a process safety incident, the employer must perform:

(i) An effective written safeguard protection analysis (SPA) to determine the effectiveness of existing individual safeguards;
(ii) The combined effectiveness of all existing safeguards for each failure scenario in the PHA;
(iii) The individual and combined effectiveness of safeguards recommended in the PHA; and
(iv) The individual and combined effectiveness of additional or alternative safeguards that may be needed.

(b) All independent protection layers for each failure scenario must be independent of each other and independent of initiating causes.

(c) The SPA must utilize a quantitative or semi-quantitative method, such as layer of protection analysis (LOPA), or an equally effective method to identify the most protective safeguards. The risk reduction attainable by each safeguard must be based on site-specific failure rate data, or in the absence of such data, industry failure rate data for each device, system, or human factor.

(d) The SPA must be conducted by at least one qualified individual with expertise in the specific SPA methodology being used. The SPA may be performed as part of the PHA or as a stand-alone analysis.

(e) The SPA must document the likelihood and severity of all potential initiating events, including equipment failures, human factors, loss of flow control, loss of pressure control, loss of temperature control, loss of level control, excess reaction, and other conditions that may lead to a loss of containment. The SPA must document the risk reduction achieved by each safeguard for all potential initiating events.

(f) The employer must complete all SPAs within six months of the completion or revalidation of the PHA.

(3) Hierarchy of hazard controls analysis.

(a) The employer must conduct a hierarchy of hazard controls analysis (HCA) as a stand-alone analysis for all existing processes. For the HCA on existing processes, the team must review the PHA while conducting the HCA. The HCA for existing

processes must be performed in accordance with the following schedule, and may be performed in conjunction with the PHA schedule:

(i) No less than 50 percent of existing processes within three years of the effective date of this chapter;
(ii) Remaining processes within five years of the effective date of this chapter;
(iii) All HCAs for existing processes must be updated and revalidated as standalone analyses at least every five years.

(b) The employer must also conduct an HCA in a timely manner as follows:

(i) For all recommendations made by a PHA team for each scenario that identifies the potential for a process safety incident, pursuant to **section XXXX**;
(ii) For all recommendations that result from the investigation of a process safety incident, pursuant to **section XXXX**;
(iii) As part of managing changes, whenever a major change is proposed, pursuant to **section XXXX**; and
(iv) During the design and review of new processes, new process units and new facilities, and their related process equipment.

(c) HCAs must be documented, performed, updated and revalidated by a team with expertise in engineering and process operations. The team must include one member knowledgeable in the HCA methodology being used, and at least one operating employee who currently operates the process and has expertise and experience specific to the process being evaluated. As necessary, the team must consult with individuals with expertise in damage mechanisms, process chemistry, and control systems.

(d) The HCA team must:

(i) Compile or develop all risk-relevant data for each process or recommendation;
(ii) Identify, characterize, and prioritize risks posed by each process safety hazard;
(iii) Identify, analyze, and document all inherent safety measures and safeguards for each process safety hazard in the following sequence and priority order, from most preferred to least preferred:

(A) First order inherent safety measures;

(B) Second order inherent safety measures;

(C) Passive safeguards;

(D) Active safeguards; and

(E) Procedural safeguards.

(iv) For purposes of this section, first order inherent safety measures are considered to be most effective and procedural safeguards are considered to be least effective.

(v) Identify, analyze, and document relevant, publicly available information on inherent safety measures and safeguards. This information must include inherent safety measures and safeguards that have been:

(A) Achieved in practice by the petroleum refining industry and related industrial sectors; and

(B) Required or recommended for the petroleum refining industry and related industrial sectors, by a federal or state agency, or local agency, in a regulation or report.

(vi) For each process safety hazard identified, develop written recommendations in the following sequence and priority order:

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

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

(C) Effectively reduce remaining risks using passive safeguards

(D) Effectively reduce remaining risks using active safeguards; and,

(E) Effectively reduce remaining risks using procedural safeguards.

(e) The HCA team must complete an HCA report within ninety calendar days of developing the recommendations. The employer must append the HCA report to the PHA report. The report must include:

(i) A description of the composition, experience and expertise of the team;

(ii) A description of the HCA methodology used by the team;

(iii) A description of each process safety hazard analyzed by the team;

(iv) A description of the inherent safety measures and safeguards analyzed by the team; and

(v) The rationale for the inherent safety measures and safeguards recommended by the team for each process safety hazard.

(4) The employer must implement all recommendations in accordance with **WAC 296-67-XXXX** Corrective action program.

(5) The employer must provide for employee collaboration in conducting process hazard analyses (PHAs), safeguard protection analyses (SPAs), and hierarchy of hazard controls analyses (HCAs).

(6) Employers must retain the initial, updated and revalidation of process hazard analyses (PHAs), safeguard protection analyses (SPAs), and hierarchy of hazard controls analyses (HCAs) for each process covered by this part, as well as the documented resolution of recommendations described in this section, for the life of the process.

WAC 296-67-XXXX Operating procedures.

(1) The employer must develop, implement, and maintain effective written operating procedures. The operating procedures must provide clear instructions for safely conducting activities involved in each process. The operating procedures must be consistent with the PSI and, at a minimum, must address the following:

(a) Steps for each operating phase or mode of operation:

(i) Start up;

(ii) Normal operations;

(iii) Temporary operations as needed;

(iv) Emergency operations;

(v) Emergency shutdown, including the conditions under which emergency shutdown is required; provisions granting the authority of the qualified operator to partially or completely shut down the operation or process; and the assignment of responsibilities to qualified operators in order to ensure that emergency shutdown is executed in a safe and timely manner;

(vi) Normal shutdown;

(vii) Start-up following a turnaround, or planned or unplanned shutdown, or after an emergency shutdown; and

(viii) Non-routine work.

(b) Operating limits:

(i) Consequences of deviations; and

(ii) Steps to correct or avoid deviations.

(c) Safety and health considerations:

(i) Properties of, and hazards presented by, the chemicals used in the process;

(ii) Precautions necessary to prevent exposure, including passive, active and procedural safeguards, personal protective equipment, engineering controls, and administrative controls;

(iii) Protective measures to be taken if physical contact or airborne exposure occurs;

(iv) Safety procedures for opening process equipment;

(v) Verification of the composition and properties of raw materials and control of hazardous chemical inventory levels;

(vi) Any special or unique hazards;

(vii) The minimum number of employees required to safely execute the procedure; and

(viii) Human factors.

(d) Safety systems and their functions.

(2) Written operating procedures must be readily accessible to all affected employees, including the employees of contractors, and any other affected employee who works in or near the process.

(3) Written operating procedures must be reviewed and updated as often as necessary to ensure that they reflect current, safe operating practices. The operating procedures must include any changes that result from alterations in process chemicals, technology, personnel, process

equipment or other changes to the facility. Changes to operating procedures must be managed in accordance with the requirements of **WAC 296-67-XXXX**.

(4) The employer must annually certify and document that written operating procedures are current and accurate.

(5) The employer must develop, implement, and maintain effective written safe work practices applicable to all affected employees. Safe work practices must be established for specific activities that include, but are not limited to:

(a) Opening process equipment or piping;
(b) Tasks requiring lock-out/tag-out procedures;
(c) Confined space entry;
(d) Handling, controlling and stopping leaks, spills, releases and discharges;
(e) Control over entry into hazardous work areas by maintenance, contractor, laboratory or other support personnel.

(6) The written operating procedures must include emergency procedures for each process, including any responses to the over-pressurizing or overheating of equipment or piping, and the handling of leaks, spills, releases and discharges of hazardous materials. These written operating procedures must provide that only qualified operators may initiate these operations, and that prior to allowing employees in the vicinity of a leak, release or discharge, the employer must, at a minimum, do one of the following:

(a) Define the conditions for handling leaks, spills, or discharges that provide a level of protection that is functionally equivalent to, or safer than, shutting down or isolating the process;
(b) Isolate any vessel, piping, and equipment where a leak, spill, or discharge is occurring; or
(c) Shutdown and depressurize all process operations where a leak, release, or discharge is occurring.

(8) The employer must provide for employee collaboration, pursuant to **WAC 296-67-XXXX**.

WAC 296-67-XXXX Training.

(1) Initial training.

(a) Each affected employee involved in the operation of a process, and each employee prior to working in a newly assigned process, including employees of contractors, must be trained in an overview of the process and in the operating procedures, pursuant to **WAC 296-67-XXXX**.

(b) Each affected employee involved in the maintenance of a process, and each maintenance employee prior to working in a newly assigned process, including employees of contractors, must be trained in an overview of the process and in the relevant hazards and safe work practices, pursuant to section **WAC 296-67-XXXX**.

(c) The training must include the following material applicable to the employee's job tasks: safety and health hazards; procedures, including emergency operations and shut-down; and safe work practices.

(2) Refresher and supplemental training.

(a) At least once every three years, and more often if necessary, the employer must provide effective refresher and supplemental training to each operating employee to ensure that each employee understands and adheres to current operating procedures.

(b) At least once every three years, and more often if necessary, the employer must provide effective refresher and supplemental training to each maintenance employee to ensure that each employee understands and adheres to current maintenance procedures.

(c) The employer, in consultation with the employees involved in operating or maintaining a process, must determine the appropriate frequency and content of refresher training.

(3) Training certification.

(a) The employer must ensure that each affected employee involved in operating or maintaining a process has received, understood and successfully completed training as specified by this section.

(b) The employer, after the initial or refresher training, must prepare a certification record containing the identity of the employee, the date(s) of training, the means used to verify that the employee understood the training, and the signature(s) of the person(s) who administered the training.

(4) The employer must develop, implement, and maintain an effective written program that includes the following:

(a) The requirements that an employee must meet in order to be designated as qualified; and

(b) Employee testing procedures to verify understanding and to ensure competency in job skill levels and work practices that protect employee safety and health.

(5) Within twenty-four months of the effective date of this chapter, the employer must develop, implement, and maintain an effective written training program to ensure that all affected employees are aware of and understand all PSM elements described in this chapter. Employees and employee representatives participating in a team pursuant to this chapter must be trained in the PSM elements relevant to that team.

(6) The employer must provide for employee collaboration in developing, implementing, and maintaining the training program, pursuant to **WAC 296-67-XXXX**.

WAC 296-67-XXXX Contractors.

(1) Application. This section applies to contractors performing maintenance, repair, supply services, turnaround, major renovation, or specialty work on or adjacent to a covered process. It does not apply to contractors providing incidental services that do not affect process safety, such as janitorial work, food and drink services, laundry, delivery or other supply services.

(2) Refinery employer responsibilities.

(a) When selecting a contractor, the refinery employer must obtain and evaluate information regarding the contract employer's safety performance, including

programs used to prevent employee injuries and illnesses, and must require that its contractors and any subcontractors use a skilled and trained workforce.

(b) The refinery employer must inform the contractor, and must ensure that the contractor has informed each of its employees of the following:

(i) Potential process safety hazards associated with the contractor's work;
(ii) Applicable refinery safety rules;
(iii) Applicable provisions of this chapter, including the requirements of **WAC 296-67-XXXX** Emergency planning and response, and WAC 296-24-567 Employee emergency plans and fire prevention plans.

(c) The refinery employer must develop, implement, and maintain effective written procedures and safe work practices to ensure the safe entry, presence and exit of the contractor and employees of the contractor process areas.

(d) The refinery employer must periodically evaluate the performance of contractors in fulfilling their obligations as specified in this section. The refinery employer must ensure and document that the requirements of this section are performed and completed by the contractor.

(e) The refinery employer must obtain and make available to the Division of Occupational Safety and Health (DOSH) upon request, a copy of the contractor's injury and illness log related to the contractor's work in the process area.

(3) Contractor responsibilities.

(a) The contractor must ensure that all of its employees are effectively trained pursuant to **WAC 296-67-XXXX** in the work practices necessary to safely perform their jobs, including:

(i) Potential process safety hazards related to their jobs;
(ii) Applicable refinery safety rules;
(iii) The specific actions to take in an emergency; and

(iv) Applicable provisions of this chapter, including the provisions of the Emergency Action Plan, pursuant to **WAC 296-67-XXXX**.

(b) The contractor must document that each contract employee has received and understood the training required by this section. The contractor must prepare a record that contains the identity of the contract employee, the date and subject of training, and the means used to verify that the employee understood the training.

(c) The contractor must advise the refinery employer of any specific hazards presented by the contractor's work, as well as any hazards identified by the contractor while performing work for the refinery employer.

(4) The refinery employer and contract employer must provide for employee collaboration, pursuant to **WAC 296-67-XXXX**.

WAC 296-67-XXXX Pre-startup safety review.

(1) The employer must perform a pre-startup safety review (PSSR) for new processes and for modified processes if the modification necessitates a change in the PSI, pursuant to **section XXXX** and for partial or unplanned shutdowns. The employer must conduct a PSSR for all turnaround work performed on a process.

(2) The pre-startup safety review must confirm all of the following prior to the introduction of hazardous materials to a process:

(a) Construction, maintenance, and repair work has been performed in accordance with design specifications;

(b) Process equipment has been maintained and is operable in accordance with design specifications;

(c) Effective safety, operating, maintenance and emergency procedures are in place:

(d) For new processes, a PHA, HCA, DMR, and SPA have each been performed, as applicable, pursuant to this section and recommendations have been implemented or resolved before start up. For new or modified processes, all changes have been implemented pursuant to the requirements of **section XXXX**; and

(e) Training of all affected employees has been completed.

(3) The employer must involve affected employees in the PSSR who have expertise and experience in the operations and engineering of the process being started. An operating employee who currently works in the unit and who has expertise, and experience in the process being started must be designated as the employee representative, pursuant to **section XXXX**.

WAC 296-67-XXXX Mechanical integrity.

(1) Written procedures.

(a) The employer must develop, implement, and maintain effective written procedures to ensure the ongoing integrity of process equipment.

(b) The procedures must provide clear instructions for safely conducting maintenance activities on process equipment, consistent with the PSI for the process, pursuant to **section XXX**

(c) The procedures and inspection documents developed under this section must be readily accessible to employees and employee representatives.

(2) Training for process maintenance activities. The employer must train affected employees involved in maintaining the ongoing integrity of process equipment in an overview of that process and its corresponding hazards; and in the procedures applicable to the employee's job tasks, to ensure that the employee can perform the job tasks in a safe manner.

(3) Inspection and testing.

(a) Inspections and tests must be performed on process equipment using procedures that meet or exceed RAGAGEP.

(b) The frequency of inspections and tests of process equipment must be consistent with:

(i) The applicable manufacturer's recommendations;
(ii) Recognized and generally accepted good engineering practices (RAGAGEP);
(iii) Operating history of process equipment; and

(iv) Internal practices that are more protective than (i),(iii) or (iii) of this subsection.

(c) Inspections and tests must be performed more frequently if determined to be necessary by prior operating or equipment maintenance experience.

(d) The employer must retain documentation for each inspection and test that has been performed on process equipment. The documentation must identify the date of the inspection or test, the name of the person who performed the inspection or test, the assigned number or other such identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed, and the results of the inspection or test.

(4) Equipment deficiencies.

(a) The employer must correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information (PSI)) before further use or in a safe and timely manner when necessary means are taken to ensure safe operation. For purposes of this section, "safe and timely" is defined as the first outage after the deficiency is detected. If a temporary repair fails, the employer did not take necessary means to ensure safe operation.

(b) Repair methodologies and preventive maintenance must be consistent with recognized and generally accepted good engineering practices (RAGAGEP) or more protective internal practices.

(5) Quality assurance.

(a) The employer must ensure that all process equipment at a minimum complies with the criteria established by the PSI, pursuant to **section XXXX**. The employer must ensure that all process equipment is:

(i) Suitable for the process application for which it is or will be used;
(ii) Fabricated from the proper materials of construction; and,

(iii) Designed, constructed, installed, maintained, inspected, tested, operated and replaced in compliance with manufacturer's and other design specifications and all applicable codes and standards.

(b) If the employer installs new process equipment or has existing process equipment for which no RAGAGEP exists, the employer must document and ensure that this equipment is designed, constructed, installed, maintained, inspected, tested and operating in a safe manner.

(c) The employer must conduct regularly scheduled checks and inspections as necessary to ensure that the requirements of **subsection XXXX** are met.

(d) The employer must ensure that maintenance materials, spare parts and equipment meet design specifications and applicable codes.

(e) The employer must establish a process for evaluating new or updated codes and standards and implementing changes as appropriate to ensure safe operation.

(f) Once an equipment deficiency or failure mechanism is identified, substantially similar equipment in similar service must be evaluated for the same deficiency or failure mechanism.

WAC 296-67-XXXX Damage mechanism review.

(1) The employer must complete a damage mechanism review (DMR) for each existing and new process for which a damage mechanism exists. Where no DMR is performed, the employer must document the rationale for determining that no damage mechanisms exist. The employer must determine and document the priority order for conducting DMRs based on the process operating and maintenance history, the PHA schedule, and inspection records.

(2) The employer must complete no less than fifty percent of initial DMRs within three years and all remaining DMRs within five years of the effective date of this section. If the employer has conducted and documented a DMR for a process unit up to five years prior to the effective date of this section, and that DMR includes the elements identified in subsection (8), that DMR

may be used to satisfy the employer's obligation to complete an initial DMR under this subsection.

(3) A DMR must be revalidated at least once every five years.

(4) A DMR must be reviewed as part of a major change on a process for which a damage mechanism already exists, prior to approval of the change. If a major change may introduce a damage mechanism, a DMR must be conducted prior to approval of the change.

(5) Where a damage mechanism is identified as a contributing factor in an incident investigation pursuant to **section XXXX**, the employer must review the most recent DMRs that are relevant to the investigation. If a DMR has not been performed on the processes that are relevant to the investigation, the incident investigation team must recommend that a DMR be conducted and completed within a specified timeframe.

(6) The DMR for a process unit must be available to the team performing a PHA for that process unit.

(7) The DMR must be performed by a team with expertise in engineering, equipment and pipe inspection, damage and failure mechanisms, and the operation of the process or processes under review. The team must include one member knowledgeable in the specific DMR methodology being used. The employer must provide for employee collaboration pursuant to **section XXXX**.

(8) The DMR for each process must include:

(a) Assessment of process diagrams;
(b) Identification of all potential damage mechanisms, pursuant to **subsection XXXX**;
(c) Determination that the materials of construction are appropriate for their application and are resistant to potential damage mechanisms;
(d) Methods to prevent or mitigate damage; and
(e) Review of operating parameters to identify operating conditions that could accelerate or otherwise worsen damage, or that could minimize or eliminate damage.

(9) For purposes of this subsection, damage mechanisms include, but are not limited to:

(a) Mechanical loading failures, such as ductile fracture, brittle fracture, mechanical fatigue and buckling;

(b) Erosion, such as abrasive wear, adhesive wear and fretting;

(c) Corrosion, such as uniform corrosion, localized corrosion and pitting;

(d) Thermal-related failures, such as creep, metallurgical transformation and thermal fatigue;

(e) Cracking, such as stress-corrosion cracking;

(f) Embrittlement, such as high-temperature hydrogen attack; and

(g) Microbiologically-induced corrosion.

(10) DMRs must include an assessment of previous experience with the process, including the inspection history and all damage mechanism data; a review of industry-wide experience with the process; and all applicable standards, codes and practices.

(11) At the conclusion of the analysis, the team must prepare a written DMR report, which must include the following:

(a) The process unit and damage mechanisms analyzed;

(b) Results of all analyses conducted, pursuant to **subsection XXX**;

(c) Recommendations for temporarily mitigating damage and ensuring worker safety; and

(d) Recommendations for preventing damage.

(12) The report must be provided to and, upon request, reviewed with affected employees whose work assignments are within the process unit described in the DMR.

(13) The employer must implement all recommendations in accordance with **subsection XXXX. (Corrective action program)**

(14) DMR reports must be retained for the life of the process.

WAC 296-67-XXXX Hot work.

(1) The employer must issue a hot work permit prior to the commencement of hot work operations within or near a covered process.

(2) The permit must document that fire prevention and protection requirements found in WAC 296-24-695 have been implemented prior to beginning the hot work operations. The permit must:

(a) Indicate the date(s) and time(s) authorized for hot work, including the designated expiration of the permit;

(b) Identify the location and equipment (including the equipment identifier, if applicable) where hot work is to be performed;

(c) Identify the name and employer of the party performing the hot work.

(3) The employer must develop, implement and maintain effective written procedures for the issuance of hot work permits.

(4) Hot work permits must be kept on file for one year.

(5) The employer must provide for employee collaboration, pursuant to section XXX.

WAC 296-67-XXXX Management of change.

(1) The employer must develop, implement, and maintain effective written MOC procedures to assess and manage changes (except for replacements-in-kind) in process chemicals, technology, procedures, process equipment and facilities. The MOC procedure must include provisions for temporary repairs, including temporary pipe repairs.

(2) The MOC procedures must ensure that the following are addressed and documented prior to any change:

(a) The technical basis for the proposed change;
(b) Potential process safety impacts of the change.
(c) Modifications to operating and maintenance procedures or development of new operating and maintenance procedures;
(d) The time period required for the change; and,
(e) Authorization requirements for the proposed change.

(3) Prior to implementing a major change, the employer must review or conduct a DMR pursuant to **section XXXX** and perform an HCA pursuant to **section XXXX**. The findings of the DMR and recommendations of the HCA must be included in the MOC documentation.

(4) The employer must use qualified personnel and appropriate methods for all MOCs, based upon hazard, complexity and type of change.

(5) The employer must provide for employee collaboration pursuant to **section XXXX**.

(6) Affected employees must be informed of, and effectively trained in, the change in a timely manner, prior to implementation of the change.

(7) If a change covered by this section results in a change to the PSI, such information must be amended and updated in a timely manner, in accordance with section XXX.

(8) If a change covered by this section results in a change to the Operating Procedures, the procedures must be amended and updated in a timely manner, in accordance with **section XXXX**.

WAC 296-67-XXXX Management of organizational change.

(1) The employer must develop, implement and maintain effective written procedures to manage organizational changes.

(2) The employer must designate a team to conduct a MOOC assessment prior to reducing staffing levels, reducing classification levels of employees, changing shift duration, or increasing employee responsibilities at or above 15 percent. The employer must provide for employee collaboration pursuant to **section XXXX**. The MOOC assessment is required for changes with a duration exceeding ninety calendar days affecting operations, engineering, maintenance, health and safety, or emergency response. This requirement must also apply to employers using employees of contractors in permanent positions.

(3) The MOOC assessment must be in writing and must include a description of the change being proposed, the make-up of the team responsible for assessing the proposed change, the factors evaluated by the team, and the team's findings and recommendations.

(4) Prior to conducting the MOOC assessment, the employer must ensure that the job function descriptions are current and accurate for all positions potentially affected by the change.

(5) The refinery manager must certify based on information and belief formed after reasonable inquiry that the MOOC assessment is accurate and that the proposed organizational change meets the requirements of this section.

(6) All MOOC assessments must include an analysis of human factors, pursuant to **section XXXX**.

(7) Prior to implementing a change, the employer must inform all employees potentially affected by the change.

WAC 296-67-XXXX Incident investigation - root cause analysis.

(1) The employer must develop, implement and maintain effective written procedures for promptly investigating and reporting any incident that results in, or could reasonably have resulted in, a process safety incident. The written procedures must include an effective method for conducting a thorough root cause analysis, including identification of management system failures and organizational and safety culture deficiencies.

(2) The employer must initiate the incident investigation as promptly as possible, but no later than forty-eight hours following the incident.

(3) The employer must establish an incident investigation team, which at a minimum must consist of a person with expertise and experience in the process involved; a person with expertise in the employer's root cause analysis method; and a person with expertise in overseeing the investigation and analysis. The employer must provide for employee collaboration pursuant to section XXX. If the incident involved the work of a contractor, a representative of the contractor's employees must be included on the investigation team.

(4) The incident investigation team must implement the employer's root cause analysis method to determine the initiating and underlying causes of the incident. The analysis must include

identification of management system failures, including organizational and safety culture deficiencies.

(5) The incident investigation team must develop recommendations to address the findings of the root cause analysis. The recommendations must include interim measures that will prevent a recurrence or similar incident until final corrective actions can be implemented.

(6) The incident investigation team must prepare a written investigation report within ninety calendar days of the incident. The team must prepare a final investigation report within four months of the incident.

(7) Investigation reports must include:

(a) The date and time of the incident;
(b) The date and time the investigation began;
(c) A detailed description of the incident;
(d) The factors that caused or contributed to the incident, including direct causes, indirect causes and root causes, determined through the root cause analysis.
(e) A list of any DMR(s), PHA(s), SPA(s), and HCA(s) that were reviewed as part of the investigation;
(f) Documentation of relevant findings from the review of DMR(s), PHA(s), SPA(s), and HCA(s);
(g) The incident investigation team's recommendations; and
(h) Interim measures implemented by the employer.

(8) The employer must implement all recommendations in accordance with section XXX.

(9) The employer must complete an HCA in a timely manner for all recommendations that result from the investigation of a major incident. The employer must append the HCA report to the investigation report.

(10) Within one week upon the completion of reports required under subsection six, the reports must be provided to affected employees. Upon request the employer must review the report

with affected employees. These reports must be provided upon request to affected employee representatives and employers of affected employees.

(11) Any draft or final report required in subsection six and related documentation must be provided immediately to the department upon written request.

(12) Incident investigation reports must be retained for the life of the process unit.

WAC 296-67-XXXX Emergency planning and response.

(1) The employer must develop, implement and maintain an effective emergency response or emergency action plan for the entire plant, in accordance with the provisions of WAC 296-24-567, Employee emergency plans and fire prevention plans; and chapter 296-824 WAC, Emergency response. An emergency response plan must define and include procedures for handling all of the below:

(a) Large and small spills or releases;
(b) Fires;
(c) Explosions; and
(d) Any other emergency with a direct bearing on employee safety and health.

(2 The written plan must specify how an emergency response will be executed if it exceeds the capability of the employer's internal emergency response team.

(3) The employer must provide for employee collaboration.

WAC 296-67-XXXX Compliance audits.

(1) Every three years, the employer must conduct an effective compliance audit. The employer must certify that they have evaluated compliance with the provisions of this chapter to verify that the procedures and practices developed under this chapter are effective and being followed. The employer must prepare a written report of the findings of the compliance audit.

(2) The compliance audit must be conducted by at least one person with expertise and experience in the requirements of the section under review. As part of the compliance audit, the employer

must consult with operators with expertise and experience in each process audited and must document the findings and recommendations from these consultations in the written report. The report must state the qualifications and identity of the persons performing the compliance audit.

(3) The employer must make the report available to employees and employee representatives pursuant to **section XXXX**. The employer must respond in writing within sixty days to any written comments submitted by an employee or employee representative regarding the report.

(4) The employer must implement all recommendations in accordance with **section XXXX**.

(5) The employer must retain the three most recent compliance audit reports.

WAC 296-67-XXXX Trade secrets.

(1) Without regard to possible trade secret status of such information, employers must make all information necessary to comply with the section available to those persons responsible for compiling the process safety information (required by **WAC 296-67-XXXX**), those assisting in the development of the process hazard analysis (required by **WAC 296-67-XXXX**), those responsible for developing the operating procedures (required by **WAC 296-67-XXXX**), and those involved in incident investigations (required by **WAC 296-67-XXXX**), emergency planning and response (**WAC 296-67-XXXX**) and compliance audits (**WAC 296-67-XXXX**).

(2) Nothing in this section precludes the employer from requiring the persons to whom the information is made available under this section to enter into confidentiality agreements not to disclose the information as set forth in WAC 296-901-14018, Trade secrets.

WAC 296-67-XXXX Process safety culture assessment.

(1) The employer must develop, implement and maintain an effective process safety culture assessment (PSCA) program.

(2) The employer must conduct an effective PSCA and produce a written report within eighteen months following the effective date of this chapter, and at least every five years thereafter. If the employer has conducted and documented a PSCA up to eighteen months prior to the effective date of this chapter, and that PSCA includes the elements required in this section, that PSCA may be used to satisfy the employer's obligation to complete an initial PSCA.

(3) The PSCA must be developed and implemented by a team that must include at least one member knowledgeable in refinery operations and at least one employee representative. The employer must provide for employee collaboration, pursuant to section XXX. The team must consult with at least one employee or another individual with expertise in assessing process safety culture in the petroleum refining industry.

(4) The PSCA must at least include an evaluation of the effectiveness of the following elements of process safety leadership:

(a) The employer's hazard reporting program;
(b) The employer's response to reports of hazards;
(c) The employer's procedures to ensure that incentive programs do not discourage reporting of hazards;
(d) The employer's procedures to ensure that process safety is prioritized during upset or emergency conditions.
(e) Employee collaboration practices;
(f) Compliance with government regulations, RAGAGEPs and internal policies and procedures;
(g) Asset integrity and reliability;
(h) Contractor management;
(i) Safe work practices;
(j) Employee competency, training, and performance assurance; and
(k) Compliance audits.

(5) The team must develop a written report within ninety calendar days of completion of the PSCA, which must include:

(a) The method(s) used to conduct the PSCA;
(b) The findings and conclusions of the PSCA; and

(c) The team's recommendations to address the findings of the PSCA.

(6) The employer, in consultation with the PSCA team, must prioritize recommendations and implement corrective actions within twenty-four months of completion of the written report.

(7) The PSCA team must conduct a written interim assessment of the implementation and effectiveness of each PSCA corrective action within three years following the completion of a PSCA report. If a corrective action is found to be ineffective, the employer must implement changes necessary to ensure effectiveness within, but not to exceed, six months.

(8) The refinery manager must serve as signatory to all PSCA reports, corrective action plans and interim assessments.

(9) PSCA reports, corrective action plans and interim assessments must be communicated and made available to all employees, their representatives, and participating contractors within sixty calendar days of completion.

(10) Participating contractors must provide PSCA reports, corrective action plans, and interim assessments to their employees and employee representatives within fourteen calendar days of receipt.

WAC 296-67-XXXX Human factors.

(1) The employer must develop, implement and maintain an effective written human factors program within eighteen months following the effective date of this chapter.

(2) The employer must include a written analysis of human factors that, at a minimum, represents industry recognized and generally accepted good engineering practices (RAGAGEP) relevant to MOCs, incident investigations, PHAs, MOOCs, and HCAs. The analysis must include a description of the selected methodologies and criteria for their use.

(3) The employer must assess human factors in existing operating and maintenance procedures and must revise these procedures accordingly. The employer must complete fifty percent of

assessments and revisions within three years following the effective date of this section and one hundred percent within five years.

(4) The human factors analysis must apply an effective method in evaluating at least the following:

(a) Staffing levels;
(b) Complexity of tasks;
(c) Length of time needed to complete tasks;
(d) Level of training, experience and expertise of employees;
(e) Human-machine and human-system interface;
(f) Physical challenges of the work environment in which the task is performed;
(g) Employee fatigue and other effects of shiftwork and overtime;
(h) Communication systems; and
(i) The understandability and clarity of operating and maintenance procedures.

(5) The human factors analysis of process controls must include:

(a) Error-proof mechanisms;
(b) Automatic alerts; and
(c) Automatic system shutdowns.

(6) The employer must include an assessment of human factors in new and revised operating and maintenance procedures.

(7) The employer must train affected employees in the written human factors program.

(8) The employer must make available, and provide upon request, a copy of the written human factors program to affected employees and their representatives.

(9) The employer must provide for employee collaboration.

WAC 296-67-XXXX Corrective action program

(1) The employer must develop, implement and maintain an effective written corrective action program to prioritize and implement recommendations of:

(a) Process hazard analyses (PHA);
(b) Safeguard protection analyses (SPA);
(c) Damage mechanism reviews (DMR);
(d) Hierarchy of hazard controls analyses (HCA);
(e) Incident investigations; and
(f) Compliance audits.

(2) All findings and associated recommendations must be provided to the employer by the team performing the analysis, review, investigation, or audit in a timely manner.

(3) The employer may reject a team recommendation if the employer can demonstrate in writing that the recommendation meets one of the following criteria:

(a) The analysis upon which the recommendation is based contains material factual errors;
(b) The recommendation is not relevant to process safety; or
(c) The recommendation is infeasible; however, a determination of infeasibility must not be based solely on cost.

(4) The employer may change a team recommendation if the employer can demonstrate in writing that an alternative measure would provide an equivalent or higher order of inherent safety. The employer may change a team recommendation for a safeguard if an alternative safeguard provides an equally or more effective level of protection.

(5) The employer must document all instances where any one of the criteria in subsection (3) or (4) of this section is used for the purpose of rejecting or changing a team recommendation.

(6) Each recommendation that is changed or rejected by the employer must be communicated to onsite team members for comment and made available to offsite team members for comment. The employer must document all written comments received from team members for each changed or rejected recommendation. The employer must document a final decision for each

recommendation and must communicate it to onsite team members and make it available to offsite team members.

(7) The employer must develop and document corrective actions to implement each accepted recommendation. The employer must assign a completion date for each corrective action and a person responsible for completing the corrective action.

(8) If the employer determines that a corrective action requires revalidation of any applicable process hazard analysis (PHA), safeguard protection analysis (SPA), hierarchy of hazard controls analysis (HCA) or damage mechanism review (DMR), these revalidations must be subject to the corrective action requirements of this section. The employer must promptly append all revalidated PHAs, SPAs, DMRs, and HCAs to the applicable report.

(9) The employer must promptly complete all corrective actions and must comply with all completion dates required by this chapter. The employer must conduct an MOC for any proposed change to a completion date, pursuant to section XXX. The employer must make all completion dates available, upon request, to all affected employees and employee representatives.

(10) Except as required by subsection (11) and (13), each corrective action that does not require a process shutdown must be completed within thirty months after the completion of the analysis or review, unless the employer demonstrates in writing that it is infeasible to do so.

(11) Each corrective action from a compliance audit must be completed within eighteen months after completion of the audit, unless the employer demonstrates in writing that it is infeasible to do so. Each corrective action from an incident investigation must be completed within eighteen months after completion of the investigation, unless the employer demonstrates in writing that it is infeasible to do so.

(12) Each corrective action requiring a process shutdown must be completed during the first regularly scheduled turnaround of the applicable process, following completion of the PHA, SPA, DMR, HCA, MOC, compliance audit or incident investigation, unless the employer demonstrates in writing that it is infeasible to do so.

(13) Notwithstanding sections (10), (11) and (12), corrective actions addressing process safety hazards must be prioritized and promptly corrected, either through permanent corrections or interim safeguards sufficient to ensure employee safety and health, pending permanent corrections.

(14) Where a corrective action cannot be implemented within the time limits required in subsections (10), (11) or (12), the employer must ensure that interim safeguards are sufficient to ensure employee safety and health, pending permanent corrections. The employer must document the decision and rationale for any delay and must implement the corrective action as soon as possible. The documentation must include:

(a) The rationale for deferring the corrective action;
(b) All MOC requirements, pursuant to WAC 296-XX-XXX ;
(c) A revised timeline describing when the corrective action will be implemented; and
(d) An effective plan to make available the rationale and revised timeline to all affected employees and their representatives.

(15) The employer must track and document the completion of each corrective action and must append the documentation to the applicable PHA, SPA, DMR, HCA, incident investigation or compliance audit.

(16) For purposes of this section, a determination of infeasibility must not be based solely on cost.