

Draft 20-hour course in Advanced Refinery Safety Training – Minimal Required Elements Chart

Topic	Hours and Applicable Codes	Overview of Content
Fundamentals of Petroleum Refining	4.0 hours	
Crude oil and its properties	TBD/provider materials	<ul style="list-style-type: none"> • Basic high level as to the hazards of crude, i.e. carcinogenic fractions, temps, flammability and known locations and preventive mitigations • Fundamentals of the petroleum refining industry • Crude oil and its properties • Classes of refinery processes and refinery configurations • Properties of the refinery produced streams • Refinery hazards and emergency response procedures
Classes of refinery processes and refinery configurations	TBD/provider materials	<ul style="list-style-type: none"> • Introduction to the four key refining processes: Heavy Oil, Light Oils, • Hydro-processing and the • Peripheral Units • (Movement/storage, Cooling towers, Sulphur recovery, Flare, Utilities)
Properties of the refinery-produced streams	TBD/provider materials	<ul style="list-style-type: none"> • Fraction weights, units pulling product from and sending product to. The relationship of the units relating to the overall process
Refinery hazards and emergency response procedures	TBD/provider materials	<ul style="list-style-type: none"> • Facility-specific information
Refinery process overview	TBD/provider materials	<ul style="list-style-type: none"> • Overview of the different types of processes and related hazards
Refining Industry Safety Overview	8.0 hours	
Emergency action plan awareness	<ul style="list-style-type: none"> • WAC 296-800-310 	Details of emergency action plan concepts

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Process Safety Management for refineries	<ul style="list-style-type: none"> • Chapter 296-67 WAC 	Overview of the requirements for Process Safety Management, including: workplace assessments, stop work authority, job hazard analysis and other sections of the rule.
Emergency response	<ul style="list-style-type: none"> • Chapter 296-824 WAC, Emergency Response • WAC 296-24-567 Employee Emergency Plans and Fire Prevention Plans 	Overview
Fire brigades	<ul style="list-style-type: none"> • Chapter 296-811 WAC 	Understanding how refinery fire brigades work and limitations
Fire prevention and protection	<ul style="list-style-type: none"> • WAC 296-24-567 (general industry) • WAC 296-155-250 (construction industry) 	Basic overview of fire hazards (hydrocarbons/ignition sources, etc.)
Hazard Communication	<ul style="list-style-type: none"> • Chapter 296-901 WAC 	<ul style="list-style-type: none"> • Maintains alignment with Hazard Communication standard, Safety Data Sheets introduced, sections and their use. • Details which common chemicals exist and their locations, methods for identification (operator, signs, supervision) and briefly touch on signs & symptoms based off SDS information
Personal protective equipment (PPE) for refinery work	<ul style="list-style-type: none"> • WAC 296-800-160 (general industry) • WAC 296-155-200 (construction industry) 	<ul style="list-style-type: none"> • Fire resistant clothing • Head protection • Eye protection • Foot protection • Hearing protection • Contaminated clothing
Respiratory protection	<ul style="list-style-type: none"> • Chapter 296-842 WAC 	Overview
Hearing conservation	<ul style="list-style-type: none"> • Chapter 296-817 WAC 	Overview
Lockout/Tagout	<ul style="list-style-type: none"> • Chapter 296-803 WAC (general industry) 	Overview
	<ul style="list-style-type: none"> • WAC 296-155-429 (construction industry) 	
Confined spaces	<ul style="list-style-type: none"> • Chapter 296-809 WAC 	Overview

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	(general industry) in addition to WAC 296-155-203 (construction industry)	
Heat related illness	<ul style="list-style-type: none"> • WAC 296-62-095 	Overview
Refinery safe work practices	<ul style="list-style-type: none"> • TBD/provider materials 	Owner and contractor implemented tools – Stop Work Authority, permitting, hazard identification tools / programs, safety meetings, site audits/ observations.
Craft-specific safety training	8.0 hours	Students will learn about examples of specific interdependencies and relationships of trades for work being performed in the field. Examples will include stacked work, dissimilar trades in direct proximity with each other, dissimilar risks associated with trade types (i.e. electrical energy, product energy, radiation, potential falling objects etc.) job sequencing, and barricading
Hot work	<ul style="list-style-type: none"> • WAC 296-24-695 Fire prevention and protection (general industry) • WAC 296-155-250 Fire prevention and protection (construction industry) 	
Working at heights	<ul style="list-style-type: none"> • Chapter 296-874 WAC, Scaffolds • Chapter 296-880 WAC, Unified Safety Standards for Fall Protection 	
Electrical	<ul style="list-style-type: none"> • WAC 296-24-957 (general industry) • WAC 296-155-426 (construction industry) 	<ul style="list-style-type: none"> • Understanding electric shock and electrocution • Recognizing potential hazards around work involving electricity.
		<ul style="list-style-type: none"> • Maintaining clearances around panels • Using proper protective devices • Eliminating access to exposed energized parts
Pipefitting	<u>Chapter 296-155 WAC:</u> <ul style="list-style-type: none"> • Part H Welding and Cutting • Part D Fire protection and prevention 	<ul style="list-style-type: none"> • Basic knowledge of pipe safety: including eliminating risk of contamination in process lines through fit, purge, weld

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	<ul style="list-style-type: none"> • Part G Tools – Hand and power • Part L Rigging and Signaling with cranes • Part F-1 Rigging other than with the use of a crane (winch/tugger, chainfall, etc.) 	<p>techniques and pre & post weld buffing and machining</p> <ul style="list-style-type: none"> • Basic knowledge of testing lines e.g.: non-destructive pipe testing techniques • Safety regarding fuel and pressure pipes including design, construction, location, leak detection and environmental considerations • Pressure vessel fabrication certification • Welding qualifications • Knowledge and application of relevant standards • Pipe corrosion • Pipe cracks • Pipe modifications e.g.: removing; cutting into or destroying existing pipe lines and piping, installing new pipes, maintaining old pipes, etc.
Boilermakers	<p><u>Chapter 296-155 WAC:</u></p> <ul style="list-style-type: none"> • Part H Welding and Cutting • Part D Fire protection and prevention • Part G Tools – Hand and power • Part L Rigging and Signaling with cranes • Part F-1 Rigging other than with the use of a crane (winch/tugger, chainfall, etc.) 	<ul style="list-style-type: none"> • List the specific hazards associated with the boilermaking field • Describe the various respiratory hazards encountered by boilermakers • Discuss the hazards associated with working at height • Describe the equipment used to work at height and identify the certification requirements needed to operate that equipment
Operating engineers	<p><u>Chapter 296-155 WAC:</u></p> <ul style="list-style-type: none"> • Part L Rigging and signaling with cranes 	<ul style="list-style-type: none"> • Crane principles, rigging signaling • Forklift principles
Finishing trades	<p><u>Chapter 296-155 WAC:</u></p> <ul style="list-style-type: none"> • Part F General requirements for storage (Brick/block, handling cement/lime) • Part G Tools – Hand and power 	<ul style="list-style-type: none"> • Lead Renovator, Repair and Painting Program (RRP) Toxic Substance Control Act (TSCA) Section 402/Chapter 365-230 WAC

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	<ul style="list-style-type: none"> • Part O Concrete, Concrete forms, Shoring, and Masonry Construction 	
Cement Masons	<p><u>Chapter 296-155 WAC:</u></p> <ul style="list-style-type: none"> • Part F General requirements for storage (Brick/block, handling cement/lime) • Part G Tools – Hand and power • Part O Concrete, Concrete forms, Shoring, and Masonry Construction 	<ul style="list-style-type: none"> • How Cement Masons work relates to other work performed in the refinery
Ironworkers	<p><u>Chapter 296-155 WAC:</u></p> <ul style="list-style-type: none"> • Part H Welding and Cutting • Part D Fire protection and prevention • Part G Tools – Hand and power • Part O Concrete, Concrete forms, Shoring, and Masonry Construction (reinforcing) • Part P Steel Erection • Part L Rigging and Signaling with cranes • Part F-1 Rigging other than with the use of a crane (winch/tugger, chainfall, etc.) 	<ul style="list-style-type: none"> • How Ironworkers work relates to other work performed in the refinery