
Oil and Gas Production Technician Skill Standards



Center for the Advancement
of Process Technology

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Critical Work Function A: Maintain Wellhead System

Critical work functions
describe the skills
required for the job of
an oil and gas
production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

<p>Monitor and Regulate Wellhead Process Variables</p>	<ol style="list-style-type: none"> 1. Flow meets product/equipment specifications. 2. Pressure meets product/equipment specifications. 3. Temperature meets product/equipment specifications. 4. Pressure gauges/transducers are accurate according to operations manuals supplied by manufacturers. 5. Testing requirement schedules are maintained according to product/equipment specifications. 6. Component /system design tolerances meet requirements of the lease agreement, company rules and regulations, and governmental agencies work practices. 7. Hazard containment analysis is conducted for upstream and downstream effects of process/component function/system variables. 8. Chemicals are applied/injected according to manufacturer and engineering specifications. 9. Abnormal conditions in wellhead pressure safety high/pressure safety low valves are corrected and components are returned to service according to company policies and procedures. 10. Visible leaks and auditory leak evidence detected in wellhead system during rounds are repaired according to company specifications.
<p>Operate Manual Wellhead Valves</p>	<ol style="list-style-type: none"> 1. Valve opens with ease according to manufacturer and company specifications. 2. Valve closes with ease according to manufacturer and company specifications. 3. Pressure is bled off to meet manufacturer and company specifications using an approved valve bleed tool when servicing the valve. 4. Safe work practices are followed when opening, closing, greasing, and maintaining valves according to manufacturer and company specifications. 5. Valve is fully opened or fully closed to avoid erosion of gates according to manufacturer and company specifications.
<p>Test Wellhead Pneumatic/Hydraulic Valves</p>	<ol style="list-style-type: none"> 1. Surface Safety Valve closing time meets appropriate regulatory agency requirements. 2. Surface Safety Valve holding test is within appropriate regulatory agency limits. 3. Surface-controlled Sub-surface Safety Valve timing is within appropriate regulatory agency requirements. 4. Surface-controlled Sub-surface Safety Valve holding test does not exceed appropriate regulatory agency limits. 5. Timing circuit meets appropriate regulatory agency requirements. 6. Flow Safety Valve holding test is within appropriate regulatory agency requirements when pressure is bled off and it prevents backflow. 7. Shut down valve functions according to appropriate regulatory agency specifications.

*NOTE: For the purpose of this document, the verb "maintain" encompasses monitoring, regulating, controlling, operating and performing maintenance.

Key Activities	Performance Criteria
<p>Monitor and Regulate Well Production</p>	<ol style="list-style-type: none"> 1. Well flow rate test meets appropriate regulatory agency specifications. 2. Wellhead sampling (gas, well fluids, sand, oil, water) is within safe operational parameters according to defined company standards. 3. Wellhead sampling on artificially lifted well is within safe operational parameters according to defined company standards. 4. Flow tubing pressure is within normal limits according to flow rate samples. 5. Flow rate abnormalities are isolated according to appropriate regulatory agency requirements to assure that safe operational parameters are maintained. 6. Each well is tested for production rates according to appropriate regulatory agency regulations. 7. Nodel analysis is conducted to minimize flow restriction due to overuse of flow tees, elbows and pipe bends according to defined company standards.
<p>Perform Reservoir Maintenance</p>	<ol style="list-style-type: none"> 1. Testing and sampling are within established appropriate regulatory agency parameters. 2. Injection pressures and rates are consistent and meet established company parameters for maximum production. 3. Flow rates are consistent and meet company parameters. Rates are determined through the results of well testing. 4. Artificial lift systems are maintained according to established company engineering parameters. 5. Flow line fluid samples are checked as specified by company standards to detect basic sediment and water, sand production, corrosion, paraffin, scale, etc. 6. Chemicals are applied/injected according to manufacturer and company specifications. 7. Oil gravities are checked at each well test according to company specifications. 8. Gas gravities are checked monthly for CO₂, H₂S, etc., according to customer and company specifications. 9. Abnormalities including the presence of sand and erosion are reported according to company operating and safety specifications. 10. Casing annuli are monitored monthly for sustained casing pressure according to appropriate agency regulations.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, National Fire Protection Agency (NFPA), process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Well Design	Knowledge of individual components (e.g., packers, tubing, tubing hanger, valves, safety systems, choke, artificial lift systems) and their functions.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation; gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Gas Compression Systems	Knowledge of gas compression system components (e.g., compressor, drivers, lube/oil systems, vibration detection, seals, surge and recycle control) and their function (e.g., hazards associated with liquid production and hydrate formation).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).
Secondary Recovery	Knowledge of fundamentals of secondary recovery of process fluids and performance optimization (e.g., artificial lift—water flood, submersible and surface pumps, gas lift).
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Oil and Gas Chemical Treatment	Knowledge of basic oil/gas chemical treatment (e.g., demulsifiers, defoamers, scale inhibitors, corrosion inhibitors, hydrate inhibitors) and their effects (e.g., loss of chemical treatment, overtreatment, undertreatment, compatibility).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Metering and Allocation	Knowledge of metering and allocation fundamentals (e.g., Lease Accounting Custody Transfer (LACT) unit, American Gas Association (AGA) meters, allocation back to specific wells, calibrations, and proving) to ensure all stakeholders receive their designated share.
Sampling	Knowledge of safe collection of process fluids (e.g., oil, gas, water) while considering such things as PPE, tools and equipment, ventilation, collection point, and testing on site or sending to designated site as required.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
To Persuade		4	MH	
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH

Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. Scale: HH = high complexity; MM = moderate complexity; and LL = low complexity. At this time, these ratings are provided for workers only.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers	Complexity Subdimension Rating for Workers
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
	Solution Complexity	Resourcefulness Needed	2	ML
Making Decisions and Judgments	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		3	MM	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Critical Work Function B: Maintain Separation System

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

<p>Monitor and Regulate Separation Process Variables</p>	<ol style="list-style-type: none"> 1. Flow meets product/equipment specifications. 2. Pressure meets product/equipment specifications. 3. Temperature meets product/equipment specifications. 4. Separator system is inspected to detect leaks according to company specifications. 5. Pressure/ level controllers are operating according to appropriate agency regulations and equipment specifications. 6. Pressure/level controller set points are established according to appropriate agency regulations and equipment specifications. 7. Gauges, transmitters, transducers, and sight glasses are checked for accuracy according to product/equipment specifications. 8. System backpressure is maintained at the lowest setting possible. 9. Heater treater is operating according to pipeline specifications. 10. Abnormal conditions in separator components are corrected and components are returned to service according to appropriate agency regulations. 11. Chemicals are applied/injected according to company specifications.
<p>Adjust or Repair Separation System Safety Devices</p>	<ol style="list-style-type: none"> 1. Level safety high/level safety low and shut down valve are set according to operating conditions to avoid upset condition upstream or downstream of vessel. 2. Pressure safety high/low sensors are set according to operating conditions and appropriate agency requirements to avoid upset conditions upstream or downstream of vessel. 3. Testing of all safety devices is recorded on the test report. 4. Set points on pressure safety high/low sensors are within appropriate regulatory agency specifications. 5. Range chart used to determine the set pressures is on file and checked to verify settings anytime there is a change in operating conditions per appropriate regulatory agency regulations. 6. Pressure safety valve is in service and relief pressure is set according to specifications and appropriate regulatory agency requirements. 7. Flow safety valves are functioning according to equipment pressure ratings for specific facility. 8. Changes to the safety devices are recorded in the support documentation according to manufacturer and company specifications.
<p>Set Separation System Operating Range</p>	<ol style="list-style-type: none"> 1. Level safety high/low alarms sound during testing at the correct level as determined by company and equipment specifications. 2. Safety devices are tested according to appropriate regulatory agency procedures. 3. Pressure safety high/low alarms sound during testing at the correct pressure as specified by appropriate regulatory agency procedures. 4. Pressure/level controllers are observed for operating condition according to company and equipment specifications. 5. Pressure/level controller set points are established according to equipment specifications. 6. Pressure safety high/low sensor set point is within appropriate regulatory agency requirements. 7. Pressure safety high/low sensors are tested according to appropriate regulatory agency procedures.
<p>Operate Header System</p>	<ol style="list-style-type: none"> 1. Well fluid is directed to correct header as specified by the operating conditions. 2. Well pressure mode is selected for test separator operation according to operating conditions and company specifications. 3. Test separator is in the same mode as the well pressure mode according to operating conditions and company specifications. 4. Backpressure valve on the test system is adjusted according to the type well in the test system and company specifications.

Knowledge and Skills

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OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation: gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Gas Compression Systems	Knowledge of gas compression system components (e.g., compressor, drivers, lube/oil systems, vibration detection, seals, surge and recycle control) and their function (e.g., hazards associated with liquid production and hydrate formation).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Oil and Gas Chemical Treatment	Knowledge of basic oil/gas chemical treatment (e.g., demulsifiers, defoamers, scale inhibitors, corrosion inhibitors, hydrate inhibitors) and their effects (e.g., loss of chemical treatment, overtreatment, undertreatment, compatibility).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Metering and Allocation	Knowledge of metering and allocation fundamentals (e.g., LACT unit—Lease Accounting Custody Transfer, AGA—American Gas Association meters, allocation back to specific wells, calibrations, and proving) to ensure all stakeholders receive their designated share.
Sampling	Knowledge of safe collection of process fluids (e.g., oil, gas, water) while considering such things as PPE, tools and equipment, ventilation, collection point, and testing on site or sending to designated site as required.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Utility Systems	Knowledge of utility systems (e.g., pneumatic—instrument air, utility air; hydraulics; high- and low- pressure nitrogen; water systems—ionized, potable, non-potable, fire, produced, utility) their appropriate uses and proper disposal.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
	Complexity of Writing Product	Type of Product	3	MM
		Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		3	MM	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	3	MM
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Critical Work Function C: Maintain Compression System

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

Key Activities	Performance Criteria
<p>Monitor and Regulate Compressor Process Variables</p>	<ol style="list-style-type: none"> Suction pressure, interstage pressure, and discharge gauges are within product/equipment specifications. Levels on scrubber (sight glass) are within product/equipment specifications. Pressure/level controllers are operating within equipment specifications. Pressure/level controller set points are established within equipment specifications. Temperature, oil pressure, vacuum pressure, and speed of engine (gauges) are within product/equipment specifications. Compressor oil pressure and lubricator flow rate are within production/equipment specifications. Compressor temperature stages are within product/equipment specifications. Cooler temperature is within product/equipment specifications. Oil levels of the engine, compressor, and supply (day) tanks are adequate according to production/equipment specifications. Level of the coolant, (day) tanks and equipment are adequate according to production/equipment specifications. Specified guards and insulation are in place to protect personnel from contact with hot surfaces according to appropriate regulatory agency specifications. Signs are in place warning personnel of high noise levels according to appropriate regulatory agency specifications. Vibration switches are in place and activate to avoid damage to equipment as specified in equipment parameters. Visible leaks and auditory leak evidence detected in compressor system during rounds are repaired according to company specifications. Abnormal conditions in compressor components are corrected and components are returned to service according to appropriate agency regulations.
<p>Adjust or Repair Compressor Safety Devices</p>	<ol style="list-style-type: none"> Level safety high/low sensors and shut down valve sensors are within safe operational parameters according to appropriate regulatory agency and equipment manufacturer specifications. Pressure safety high/low sensors are within safe operational parameters according to appropriate regulatory agency and equipment manufacturer specifications. Set point on pressure safety high/low sensors are within appropriate regulatory agency specifications. Flow safety valves are installed according to product, manufacturer, and company specifications. Blow down valve operates as needed according to appropriate regulatory agency and equipment manufacturer specifications. Compressor safety devices are tested and maintained as required by appropriate regulatory agency and company specifications.
<p>Test Safety Components of Compression System</p>	<ol style="list-style-type: none"> Safety devices are tested with specified time limits according to appropriate regulatory agency specifications. Safety devices are tested to specifications provided by the company and appropriate regulatory agency. Safety devices are tested according to appropriate agency regulations and American Petroleum Institute recommended practices. Safety device test results are recorded using company specified forms.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation: gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Gas Compression Systems	Knowledge of gas compression system components (e.g., compressor, drivers, lube/oil systems, vibration detection, seals, surge and recycle control) and their function (e.g., hazards associated with liquid production and hydrate formation).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Fuel Gas	Knowledge of fuel gas components (e.g., scrubbers, filter, heat exchanger, fuel valves) its function and use.
Utility Systems	Knowledge of utility systems (e.g., pneumatic—instrument air, utility air; hydraulics; high- and low- pressure nitrogen; water systems—ionized, potable, non-potable, fire, produced, utility) their appropriate uses and proper disposal.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		3	MM	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Constraints on Resource Availability	4	MH
		Diversity	3	MM
		Structure or Protocol Required	3	MM
Adaptability	Degree of Adaptability Required	Tact and Sensitivity Required	4	MH
		Frequency of Change	4	MH
		Unpredictability of Change	4	MH
Working in Teams	Difficulty Adapting	Lack of Support for Change	2	ML
		Task Interdependence	3	MM
		Team Member Heterogeneity	3	MM
Leading Others	Work Challenges	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
		Lack of Clarity or Stability of Responsibilities	1	LO
	People Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
Building Consensus	Consensus Process Inhibitors	Scope and Complexity of Leadership Responsibility	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	3	MM
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
		Time, Resources, or Support Constraints	1	LO
	Limitations on Learning and Development Opportunities	Application Constraints	2	ML

Critical Work Function D: Maintain Dehydration System

Critical work functions describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

Monitor and Regulate Dehydration System Variables

1. Incoming pump pressure is within product/equipment specifications.
2. Outgoing pump pressure is within product/equipment specifications.
3. Condensate separator pressure, level and temperature readings are within product/equipment specifications.
4. Surge tank pressure, level and temperature readings are within product/equipment specifications.
5. Reboiler tank pressure, level and temperature readings are within product/equipment specifications.
6. Set points on dehydration system are within appropriate regulatory agency specifications.
7. Pump stroke rate is within product/equipment specifications.
8. Contact tower pressure, level and temperature readings are within product/equipment specifications.
9. Visible leaks and auditory leak evidence detected in dehydration system during rounds are repaired according to company specifications.
10. Periodic sampling of dehydrated gas indicates that it is within limits set by customer/consumer.
11. Periodic sampling of lean and rich glycol samples indicates system is performing within parameters established by company specifications.
12. Filter differential pressures are monitored and filters are changed according to company specifications.
13. Abnormal conditions in dehydration system are corrected and components are returned to service according to the appropriate agency regulations and American Petroleum Institute (API) specifications.

Adjust or Repair Dehydration System Safety Devices

1. Level safety high/low sensors and shut down valve are set according to operating conditions upstream and downstream of vessel.
2. Pressure safety high/low sensors are set according to operating conditions and appropriate regulatory agency specifications.
3. Pressure safety low on the forced air chamber is within safe operational parameters according to equipment manufacturer specifications.
4. Fuel gas system pressure safety high/low, level safety high/low and PSV are within safe operational parameters and appropriate regulatory agency specifications.
5. Set point on pressure safety high/low sensors are within appropriate regulatory agency specifications and within safe operational parameters according to equipment manufacturer specifications.
6. Temperature safety high setpoint in a heat exchange system located on the stack of the heat media is within appropriate regulatory agency specifications.
7. Abnormal conditions in the blower motor are corrected and components are returned to service according to the appropriate regulatory agency specifications and API recommended practices.
8. Abnormal conditions in the fuel gas burner are corrected and components are returned to service according to the appropriate regulatory agency specifications and API recommended practices.
9. Exhaust burner stack arrestor (natural or forced draft) functions according to appropriate regulatory agency specifications.
10. Temperature safety high on the exhaust of the burner of a direct heated (natural or forced draft) functions according to appropriate regulatory agency specifications.
11. Reboiler and surge tank's PSV, LSH/L, TSH, PSH/L, and the FSVs function according to appropriate regulatory agency specifications.
12. Heat exchanger pressure and temperature ratings are reviewed for safety devices required according to appropriate regulatory agency specifications.
13. Equipment is protected by Temperature Safety Elements according to appropriate regulatory agency requirements and API recommended practices.

Knowledge and Skills

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OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

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	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation: gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Metering and Allocation	Knowledge of metering and allocation fundamentals (e.g., LACT unit—Lease Accounting Custody Transfer, AGA—American Gas Association meters, allocation back to specific wells, calibrations, and proving) to ensure all stakeholders receive their designated share.
Sampling	Knowledge of safe collection of process fluids (e.g., oil, gas, water) while considering such things as PPE, tools and equipment, ventilation, collection point, and testing on site or sending to designated site as required.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Fuel Gas	Knowledge of fuel gas components (e.g., scrubbers, filter, heat exchanger, fuel valves) its function and use.
Utility Systems	Knowledge of utility systems (e.g., pneumatic—instrument air, utility air; hydraulics; high- and low- pressure nitrogen; water systems—ionized, potable, non-potable, fire, produced, utility) their appropriate uses and proper disposal.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		3	MM	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Goal or Role Ambiguity	Lack of Clarity or Support for Team Goals	1
	Lack of Clarity or Stability of Responsibilities		1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
		Time, Resources, or Support Constraints	1	LO
	Limitations on Learning and Development Opportunities	Application Constraints	2	ML

Critical Work Function E: Maintain Oil Treatment System

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

Monitor and Regulate Oil Treatment System Process Variables

1. Heater/treater pressure, level and temperature readings are within product/equipment specifications.
2. Outgoing percentage of basic sediment and water meets buyer specifications.
3. Chemical injection rates meet production rate specifications.
4. Backpressure valve is functioning within product/equipment specifications.
5. Pressure/level controllers are operating within equipment specifications.
6. Pressure/level controller set points are established according to operating conditions and equipment specifications.
7. Primary and backup protection devices are within safe operating parameters as determined by appropriate standards.
8. Visible leaks and auditory leak evidence detected in oil treatment system during rounds are repaired according to appropriate regulatory agency and company specifications.
9. Abnormal conditions in the oil treatment system are corrected and components are returned to service according to appropriate regulatory agency regulations and API recommended practices.

Adjust or Repair Oil Treatment Safety Devices

1. Level safety high/low sensors and shut down valves are set according to operating conditions and appropriate regulatory agency requirements.
2. Pressure safety high/low sensors are set according to operating conditions and appropriate regulatory agency requirements.
3. Set point on pressure safety high/low sensors are within appropriate regulatory agency specifications.
4. Primary and backup protection devices are within safe operating parameters as determined by appropriate standards.

Monitor and Regulate Oil Recovery

1. Oil recovery system is at operating pressure according to appropriate regulatory agency and company specifications.
2. Lease Automatic Custody Transfer is maintained according to appropriate regulatory agency specifications.
3. LACT is proven monthly according to appropriate regulatory agency specifications.
4. Abnormal conditions in oil recovery system are corrected and components are returned to service according to the appropriate regulatory agency regulations and API recommended practices.
5. Pigs keep pipeline clean according to company specifications.
6. Fire fighting system is maintained according to appropriate regulatory agency specifications.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Well Design	Knowledge of individual components (e.g., packers, tubing, tubing hanger, valves, safety systems, choke, artificial lift systems) and their functions.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation; gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).
Secondary Recovery	Knowledge of fundamentals of secondary recovery of process fluids and performance optimization (e.g., artificial lift—water flood, submersible and surface pumps, gas lift).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Oil and Gas Chemical Treatment	Knowledge of basic oil/gas chemical treatment (e.g., demulsifiers, defoamers, scale inhibitors, corrosion inhibitors, hydrate inhibitors) and their effects (e.g., loss of chemical treatment, overtreatment, undertreatment, compatibility).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Metering and Allocation	Knowledge of metering and allocation fundamentals (e.g., LACT unit—Lease Accounting Custody Transfer, AGA—American Gas Association meters, allocation back to specific wells, calibrations, and proving) to ensure all stakeholders receive their designated share.
Sampling	Knowledge of safe collection of process fluids (e.g., oil, gas, water) while considering such things as PPE, tools and equipment, ventilation, collection point, and testing on site or sending to designated site as required.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		3	MM	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	3	MM
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Critical Work Function F: Maintain Water Treatment System

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

<p>Monitor and Regulate Water Treatment Process Variables</p>	<ol style="list-style-type: none"> 1. Skimmer pressure, level and temperature readings are within product/equipment specifications. 2. Chemical injection rates meet production rate specifications. 3. Visible leaks and auditory leak evidence detected in water treatment system during rounds are repaired according to company specifications. 4. Pressure/level controllers are operational and set points are established according to operating conditions and company specifications. 5. Abnormal conditions in water treatment system are corrected and components are returned to service according to appropriate regulatory agency regulations and API recommended practices.
<p>Adjust or Repair Water Treatment Safety Devices</p>	<ol style="list-style-type: none"> 1. Level safety high/low sensors and shut down valve are set according to operating conditions appropriate regulatory agency requirements and company specifications. 2. Pressure safety high/low sensors are set according to operation conditions, appropriate regulatory agency requirements and company specifications. 3. Set point on pressure safety high/low sensors are within appropriate regulatory agency specifications. 4. Primary and secondary protection devices are within safe operating parameters as determined by appropriate regulatory agency requirements and API standards.
<p>Test Produced/Collected Water</p>	<ol style="list-style-type: none"> 1. Testing and sampling of hydrocarbon ppm in overboard water is within limits set by appropriate regulatory agency. 2. Testing and sampling of process water are within established appropriate regulatory agency parameters. 3. Testing and sampling of potable water, boiler feed water, service water and fire water are within established company specifications. 4. Testing and sampling of storm water are within established appropriate regulatory agency parameters. 5. Testing and sampling of waste water are within established appropriate regulatory agency parameters.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation: gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Oil and Gas Chemical Treatment	Knowledge of basic oil/gas chemical treatment (e.g., demulsifiers, defoamers, scale inhibitors, corrosion inhibitors, hydrate inhibitors) and their effects (e.g., loss of chemical treatment, overtreatment, undertreatment, compatibility).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Sampling	Knowledge of safe collection of process fluids (e.g., oil, gas, water) while considering such things as PPE, tools and equipment, ventilation, collection point, and testing on site or sending to designated site as required.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		3	MM	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	3	MM
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Critical Work Function G: Control Shut-In

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

<p>Shut Down Facility in Normal Mode</p>	<ol style="list-style-type: none"> 1. Manual wing valve is closed on all wells as specified by company procedures. 2. Automated and adjustable chokes on the wellhead are closed, stopping flow according to company specifications. 3. Compressors and pumps are shut down according to company specifications. 4. Lockout/Tagout is performed according to company specifications. 5. Backup power source is started according to company specifications. 6. System is depressurized following company procedures. 7. Inlet valves to vessels are closed according to company specifications.
<p>Shut Down Facility in Emergency Mode</p>	<ol style="list-style-type: none"> 1. Emergency shut down system activates within 45 seconds as specified by appropriate regulatory agency requirements and company procedures. 2. Inlet shut down valves are closed according to appropriate regulatory agency requirements and company specifications. 3. Manual wing valve is closed on all wells according to company specifications. 4. Automated and adjustable chokes on the wellhead are closed, stopping flow according to company specifications. 5. Compressors and pumps are shut down automatically according to company specifications. 6. Lockout/Tagout is performed according to company procedures. 7. Backup power source is started according to company specifications. 8. Inlet valves to vessels are closed according to company specifications. 9. System is bled down through the flare system according to company specifications. 10. Pressure gauges read "0" pressure as specified by company procedures.

Key Activities	Performance Criteria
<p>Start-up Facility After Normal Shut Down</p>	<ol style="list-style-type: none"> 1. Tripped safety systems are flagged, bypassed and monitored during start-up of facility according to appropriate regulatory agency requirements and company procedures. 2. Inlet shut down valves are reset and open according to company specifications. 3. Lockout/Tagout is removed according to company procedures. 4. Chokes on wells are opened according to company specifications. 5. Warmed compressor is loaded after reaching established temperature according to company procedures. 6. Flow is established according to documented pre-shut down rate according to company specifications. 7. Process variables on all process components are within operational parameters of product/equipment and company specifications. 8. Chemical systems are started according to company specifications. 9. Bypassed safety devices are returned to service following appropriate regulatory agency requirements and company procedures.
<p>Start-up Facility After Emergency Shut Down</p>	<ol style="list-style-type: none"> 1. Cause of emergency shut down is addressed and corrected according to company specifications. 2. Tripped safety systems are flagged, bypassed and monitored during start-up of facility according to appropriate regulatory agency requirements and company procedures. 3. Inlet shut down valves are reset and open according to company specifications. 4. Chokes on wells are opened according to company specifications. 5. Warmed compressor is loaded after reaching established temperature according to company procedures. 6. Flow is established according to documented pre-shut down rate. 7. Process variables on all process components are within operational parameters of product/equipment. 8. Chemical systems are started according to company specifications. 9. All bypassed safety devices are returned to service following appropriate regulatory agency requirements and company procedures.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Well Design	Knowledge of individual components (e.g., packers, tubing, tubing hanger, valves, safety systems, choke, artificial lift systems) and their functions.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation: gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Gas Compression Systems	Knowledge of gas compression system components (e.g., compressor, drivers, lube/oil systems, vibration detection, seals, surge and recycle control) and their function (e.g., hazards associated with liquid production and hydrate formation).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Oil and Gas Well Production	Knowledge of oil and gas well production (e.g., flowing/tubing pressures, temperatures, reservoir makeup) and the effects of the product produced (e.g., hydrocarbon chemical properties, hydrate formation, and temperature issues).
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Fuel Gas	Knowledge of fuel gas components (e.g., scrubbers, filter, heat exchanger, fuel valves) its function and use.
Electrical Power Sources	Knowledge of main power source (e.g., electrical power generation, utility power, batteries, turbines) their backup power sources (e.g., standby generator, UPS) and their function.
Utility Systems	Knowledge of utility systems (e.g., pneumatic—instrument air, utility air; hydraulics; high- and low- pressure nitrogen; water systems—ionized, potable, non-potable, fire, produced, utility) their appropriate uses and proper disposal.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	5	HI
	Complexity of Problem Solving	Mathematical Methods	3	MM
Mathematical Reasoning		3	MM	
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	4	MH
		Use of Evidence	4	MH
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	4	MH
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
To Persuade		4	MH	
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	5	HI
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	4	MH
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	1	LO
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	1	LO
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	3	MM
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	5	HI
		Number and Variety of Sources	5	HI
		Resourcefulness Needed	3	MM
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	3	MM

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	5	HI
	Solution Complexity	Number and Complexity of Possible Solutions	5	HI
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	4	MH
		Integration Difficulty	4	MH
		Quantity or Ambiguity of Risks and Consequences	4	MH
	Individual Decision-Making Responsibility	Accountability and Autonomy	5	HI
		Absence or Ambiguity of Rules or Policy Constraints	3	MM
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	4	MH
		Scope and Effects of Planning	5	HI
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	2	ML
		Constraints on Resource Availability	4	MH
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	3	MM
Adaptability	Degree of Adaptability Required	Frequency of Change	5	HI
	Difficulty Adapting	Unpredictability of Change	5	HI
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	5	HI
	Team Member Heterogeneity	Team Diversity	2	ML
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	2	ML
		Work Structuring Requirements	4	MH
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	2	ML
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	4	MH
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	2	ML
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	4	MH
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	3	MM

Critical Work Function H: Comply With Policies and Procedures

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

<p>Comply With External Regulations</p>	<ol style="list-style-type: none"> 1. Completion of MMS routine inspections is documented according to company procedures. 2. Completion of US Coast Guard routine inspections is documented according to company procedures. 3. Completion of API routine inspections is documented according to company procedures. 4. Completion of US Department of Transportation (DOT) routine inspections is documented according to company procedures. 5. Completion of OSHA routine inspections is documented according to company procedures. 6. Completion of EPA routine inspections is documented for water discharged from offshore facilities. 7. Completion of state environmental routine inspections is documented for water discharged from offshore facilities.
<p>Comply With Internal Requirements</p>	<ol style="list-style-type: none"> 1. Monthly calibration of monitoring devices is completed and documented according to appropriate regulatory agency and company specifications. 2. Waste to shore is measured and recorded according to appropriate regulatory agency and company specifications. 3. Daily pollution survey is completed and documented according to appropriate regulatory agency and company specifications. 4. Incident reports are filled out according to appropriate regulatory agency and company specifications. 5. Daily report is completed and filed according to company specifications. 6. Work orders are filled out according to company specifications. 7. Morning reports are completed and filed daily according to company specifications. 8. Helicopter routines are documented according to company specifications. 9. Safety routines are completed and documented according to company specifications.
<p>Perform Administrative Functions</p>	<ol style="list-style-type: none"> 1. Payroll and budgets are within company/customer allocation. 2. Inventories of supplies, materials and equipment are consistent with company/agency requirements. 3. Inter/Intra platform communications follow company/agency procedures. 4. Drills are conducted according to company procedures.
<p>Conduct Routine Maintenance</p>	<ol style="list-style-type: none"> 1. Container tags, labels, coupons are maintained according to appropriate regulatory agency and company specifications. 2. Pumps and generators and power supplies are free of contaminants that would impact temperature, pressure, level and flow according to company specifications. 3. Chemical tank sight glasses are calibrated, removed and repaired according to established company procedures. 4. Manual /computer generated readings are checked for discrepancies/errors according to company specifications.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

Skill Standard Name	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation; gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Gas Compression Systems	Knowledge of gas compression system components (e.g., compressor, drivers, lube/oil systems, vibration detection, seals, surge and recycle control) and their function (e.g., hazards associated with liquid production and hydrate formation).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Metering and Allocation	Knowledge of metering and allocation fundamentals (e.g., LACT unit—Lease Accounting Custody Transfer, AGA—American Gas Association meters, allocation back to specific wells, calibrations, and proving) to ensure all stakeholders receive their designated share.
Sampling	Knowledge of safe collection of process fluids (e.g., oil, gas, water) while considering such things as PPE, tools and equipment, ventilation, collection point, and testing on site or sending to designated site as required.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).
Material Handling	Knowledge of material handling (e.g., ordering, receiving, shipping, storing, inventory).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	2	ML
		Use of Evidence	2	ML
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	2	ML
	Complexity of Core Scientific Content	Physical Science	2	ML
		Life Science	2	ML
		Earth and Space Science	2	ML
	Complexity of Applied Science	Science and Technology	2	ML
Science in Personal and Social Perspective		2	ML	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	3	MM
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	2	ML
		Distractions	1	LO
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	4	MH
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	2	ML
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	2	ML
		Number and Range of Problems	2	ML
	Solution Complexity	Number and Complexity of Possible Solutions	2	ML
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	2	ML
		Integration Difficulty	2	ML
		Quantity or Ambiguity of Risks and Consequences	2	ML
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
Absence or Ambiguity of Rules or Policy Constraints		1	LO	
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	2	ML
		Flexibility Required	1	LO
		Resource Coordination Required	3	MM
		Scope and Effects of Planning	2	ML
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	2	ML
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	2	ML
	Difficulty Adapting	Unpredictability of Change	2	ML
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	2	ML
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	2	ML
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	3	MM
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	2	ML
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Critical Work Function I: Maintain Electrical Systems

Critical work functions

describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

Monitor and Regulate Generator Equipment Variables

1. Engine oil pressure meets manufacturer equipment specifications.
2. Engine water pressure meets manufacturer equipment specifications.
3. Generator outputs meet manufacturer equipment specifications.
4. 24-volt backup system is operational and charged according to manufacturer and company specifications.

Monitor and Regulate Primary and Backup Power Sources

1. Electrical components operate according to NEC parameters.
2. Faulty components are isolated and replaced according to NEC specifications.
3. Uninterrupted service of electrical components is maintained according to NEC and company specifications.
4. Backup generator outputs meet manufacturer equipment and company specifications.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Fuel Gas	Knowledge of fuel gas components (e.g., scrubbers, filter, heat exchanger, fuel valves) its function and use.
Electrical Power Sources	Knowledge of main power source (e.g., electrical power generation, utility power, batteries, turbines) their backup power sources (e.g., standby generator, UPS) and their function.
Utility Systems	Knowledge of utility systems (e.g., pneumatic—instrument air, utility air; hydraulics; high- and low- pressure nitrogen; water systems—ionized, potable, non-potable, fire, produced, utility) their appropriate uses and proper disposal.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
Science in Personal and Social Perspective		3	MM	
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	5	HI
		Complexity of Applications	5	HI
		Training Time Constraints	5	HI
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
		Absence or Ambiguity of Rules or Policy Constraints	3	MM
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	3	MM
		Resource Coordination Required	3	MM
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
		Constraints on Resource Availability	3	MM
Using Social Skills	Complexity of Social Interactions	Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	3	MM
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Critical Work Function J: Maintain Auxiliary Systems

Critical work functions describe the skills required for the job of an oil and gas production technician.

Key Activities

Key activities are the duties and tasks involved in carrying out a critical work function

Performance Criteria

Performance criteria correlate to the key activities. The performance criteria provide information on how to determine when someone is performing each key activity competently.

Monitor and Regulate Flare Scrubber Variables	<ol style="list-style-type: none"> 1. Flare scrubber pressure is within lowest operational condition for removing trapped fluids according to company specifications. 2. Flare scrubber level is within lowest operational condition for removing trapped fluids to prevent pollution according to company specifications. 3. Accumulated fluids are dumped according to company specifications. 4. Flare gas is measured to ensure compliance with monthly allowable volumes and wells contributing to flare according to appropriate regulatory agency specifications.
Adjust or Repair Safety Devices	<ol style="list-style-type: none"> 1. Fuel gas regulators are set to the correct pressure according to company specifications. 2. Pressure/level controllers are operational and set points established according to company specifications. 3. Secondary protection devices are within safe operational parameters according to company specifications.
Monitor and Regulate Fuel Gas Scrubber Variables	<ol style="list-style-type: none"> 1. Temperature readings meet equipment specifications according to company application. 2. Pressure meets equipment specifications according to company application. 3. Level meets equipment specifications according to company application. 4. Abnormal conditions in fuel gas scrubber are corrected and components are returned to service according to company specifications. 5. Fuel gas SDV closes when emergency shut down is activated according to company specifications. 6. Visible leaks and auditory leak evidence detected in gas scrubber during rounds are repaired according to company specifications.
Operate Crane	<ol style="list-style-type: none"> 1. Pre-use inspection is performed according to appropriate regulatory agency and company specifications. 2. Boat is loaded/unloaded without incident according to company specifications. 3. Run time and wench usage for maintenance schedule determination is documented according to company specifications. 4. Operators and riggers are qualified and trained in crane operations according to appropriate regulatory agency and company specifications. 5. Hearing protection is worn during crane operation according to company specifications.
Monitor and Regulate Instrument Air Supply Pressure to Pneumatic Panel	<ol style="list-style-type: none"> 1. Control relay block and bleed manual switch is operating according to appropriate regulatory agency specifications. 2. Input/output air supply pressures are normal according to company good operating practices. 3. ESD and fusible plug loop pressures are normal according to appropriate regulatory agency and company operating specifications. 4. Air supply is monitored to ensure water and contaminants are removed before going into the pneumatic system according to company specifications.

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Safe Working Practices	Knowledge of company, industry, and regulatory safe operating standards (e.g., PPE, Lockout/Tagout, electrical area classification, MOCs – management of change, MSDS, environmental regulations and compliance, emergency procedures, permitting procedures, housekeeping, and labeling – color coding, HAZ-COM, DOT, NFPA – National Fire Protection Agency, process labeling).
Safety Systems	Knowledge of safety systems for asset and personnel protection (e.g., fire/gas detection, protection, suppression, and shutdown; process safety shutdown; emergency shutdown; emergency response system – fire-fighting, evacuation, audible alarms; fusible loop; flare, relief and blowdown systems), their function, the effects of bypassing them, and relevant governing agency requirements.
Environmental Influences	Knowledge of the environmental influences (e.g., weather, facility location – off-shore, arctic, remote; work hours) and their impact on work and home life.
Industry and Regulatory Standards	Knowledge of industry standards (e.g., ANSI, API, NACE) and regulatory standards (MMS, OSHA, EPA) for safe operation of equipment and facilities.
Environmental and Health Compliance	Knowledge of environmental (e.g., air emissions, hazardous waste, trash, recyclables, permitted/non-permitted discharge) and health (e.g., hearing, blood-borne pathogens, respiratory) regulations from federal, state, and local governing bodies, regulatory agencies, and company-specific programs and their proper reporting procedures.
Transportation	Knowledge of the safe transportation of people and materials to and from locations (e.g., modes of travel—planes, helicopters, boats, trucks).
Process/Mechanical Flow Diagrams	Knowledge of the source of pressure, temperature, and flow; the path the product will travel; methods of control; critical points of control; and destination.
Process Symbols	Knowledge of process symbols (e.g., valves, temperature, flow, pressure, safety devices) and their meaning as depicted on diagrams.
Design Parameters	Knowledge of equipment specifications (i.e., vendor data information) (e.g., valves, separators, vessels, pumps, compressors) in order to ensure in specification operations.
Oil and Gas Processing and Equipment	Knowledge of oil and gas processing (e.g., two-phased and three-phased separation; gas, oil, and water conditioning—dehydration, H ₂ S and CO ₂ removal, heater/treater, chem-electric treater, skimmers, flotation cells, filtration) and the equipment used (i.e., internal/external vessel design).
Heat Exchange	Knowledge of heat exchange types (e.g., direct fire, electric, shell/tube, WHRU—waste heat recovery unit, boilers, steam generators) their function, and the associated hazards (e.g., temperature extremes, leaks, open flame, equipment used, fluid handling).
Troubleshooting	Analyze process indicators and operating parameters for in/out specification, and then identify the proper course of action to resolve the problem.

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

OCCUPATIONAL AND TECHNICAL KNOWLEDGE AND SKILLS

These are the technical knowledge and skills needed to perform the critical work function.

	Definition
Operation Monitoring	Read instrumentation locally (e.g., gauges, flow rates, temperatures), and remotely such as DCS (distributed control systems) and SCADA (supervisory control and data acquisition), manipulate the data (e.g., trending, editing, compiling) and document data for analysis.
Operation Control	Knowledge of control functions (e.g., level, pressure, flow, temperature), devices, safety control and control logic, as well as their cause and effects on the facility.
Metering and Allocation	Knowledge of metering and allocation fundamentals (e.g., LACT unit—Lease Accounting Custody Transfer, AGA—American Gas Association meters, allocation back to specific wells, calibrations, and proving) to ensure all stakeholders receive their designated share.
Testing Procedures	Knowledge of safe testing procedures (e.g., PSVs, high/low levels, high/low pressures) in accordance with manufacturer instructions, regulations, and local procedures.
Fuel Gas	Knowledge of fuel gas components (e.g., scrubbers, filter, heat exchanger, fuel valves) its function and use.
Utility Systems	Knowledge of utility systems (e.g., pneumatic—instrument air, utility air; hydraulics; high- and low- pressure nitrogen; water systems—ionized, potable, non-potable, fire, produced, utility) their appropriate uses and proper disposal.
Overhead Lifting Devices	Knowledge of overhead lifting devices (e.g., cranes, wenchers, forklift, hoist, manlift) and their safe operation.
Record Keeping	Maintain proper records (e.g., production volume, well-test reports, safety system testing, U.S. Coast Guard reports, flare and vented gas reports) and retain them for the designated time period (i.e., record retention schedule or regulatory agency requirements).
Material Handling	Knowledge of material handling (e.g., ordering, receiving, shipping, storing, inventory).

About the Worker

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating	Complexity Subdimension Rating
Math	Complexity of Mathematics Content	Number Sense and Computation	2	ML
		Geometry, Measurement, and Spatial Sense	1	LO
		Complexity of Data Analysis, Statistics, and Probability	2	ML
		Functions and Algebraic Thinking	1	LO
		Complexity of Representation and Communication	2	ML
	Complexity of Problem Solving	Mathematical Methods	2	ML
		Mathematical Reasoning	3	MM
Mathematical Tools		2	ML	
Science	Complexity of Scientific Inquiry	Design	3	MM
		Use of Evidence	3	MM
	Complexity of Understanding the Nature of Science	Unifying Concepts and Processes	3	MM
	Complexity of Core Scientific Content	Physical Science	3	MM
		Life Science	2	ML
		Earth and Space Science	3	MM
	Complexity of Applied Science	Science and Technology	3	MM
		Science in Personal and Social Perspective	3	MM
Reading	Complexity of Text		4	MH
	Complexity of Reading Skills		3	MM
	Complexity of Reading Purpose		3	MM
Writing	Complexity of Text	Complexity of Text	4	MH
		Type of Product	3	MM
	Complexity of Writing Product	Organization	3	MM
		Elaboration	3	MM
	Complexity of Writing Process	Writing Development	3	MM
	Complexity of Writing Purpose	To Inform	3	MM
		To Persuade	4	MH
Listening	Complexity of Communication	Content Complexity	3	MM
		Demands on Attention	4	MH
		Communication Indirectness	1	LO
	Barriers to Communication	Limitations on Interaction	3	MM
		Distractions	5	HI
Speaking	Complexity of Communication	Content Complexity	3	MM
		Tact and Sensitivity Required	3	MM
		Communication Indirectness	3	MM
	Context Demands	Diversity of Audience	4	MH
		Constraints on Preparation	5	HI
		Distractions	5	HI
		Listener Resistance	3	MM
Using Information and Communications Technology	Complexity of Technology Application	Complexity of Equipment or Technology	4	MH
		Complexity of Applications	3	MM
		Training Time Constraints	3	MM
	Frequency of Technology Change	New Learning Required	4	MH
Gathering and Analyzing Information	Difficulty of Information Gathering	Amount of Information	3	MM
		Number and Variety of Sources	4	MH
		Resourcefulness Needed	2	ML
	Complexity of Analysis	Complexity of Information and Analysis	3	MM
		Need to Evaluate Source Information	3	MM
		Lack of Analysis Guidelines	2	ML

Knowledge and Skills

Describes what a worker needs to know or be able to do to perform the critical work function.

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	Problem Complexity	Problem Uniqueness or Difficulty	3	MM
		Number and Range of Problems	3	MM
	Solution Complexity	Number and Complexity of Possible Solutions	3	MM
Making Decisions and Judgments	Degree of Judgment or Inference Required	Lack of Guidance or Precedents	3	MM
		Integration Difficulty	3	MM
		Quantity or Ambiguity of Risks and Consequences	3	MM
	Individual Decision-Making Responsibility	Accountability and Autonomy	4	MH
		Absence or Ambiguity of Rules or Policy Constraints	3	MM
Organizing and Planning	Complexity of Plans	Goal Complexity or Ambiguity	3	MM
		Flexibility Required	4	MH
		Resource Coordination Required	2	ML
		Scope and Effects of Planning	3	MM
	Constraints on Planning	Lack of Guidelines	2	ML
		Lack of Feedback	3	MM
Using Social Skills	Complexity of Social Interactions	Constraints on Resource Availability	4	MH
		Diversity	3	MM
		Structure or Protocol Required	3	MM
		Tact and Sensitivity Required	4	MH
Adaptability	Degree of Adaptability Required	Frequency of Change	4	MH
	Difficulty Adapting	Unpredictability of Change	4	MH
		Lack of Support for Change	2	ML
Working in Teams	Degree of Collaboration Required	Task Interdependence	3	MM
	Team Member Heterogeneity	Team Diversity	3	MM
		Lack of Clarity or Support for Team Goals	1	LO
	Goal or Role Ambiguity	Lack of Clarity or Stability of Responsibilities	1	LO
Leading Others	Work Challenges	Challenges to Goal Attainment	3	MM
		Work Structuring Requirements	3	MM
		Scope and Complexity of Leadership Responsibility	2	ML
	People Challenges	Coaching or Monitoring Needs	2	ML
		Conflict Management Needs	3	MM
Building Consensus	Consensus Process Inhibitors	Number and Diversity of Stakeholders	2	ML
		Ambiguity of Goals	2	ML
		Lack of Organizational Support, Incentives or Consensus Leadership	1	LO
		High Consensus Standard	4	MH
	Difficulty of Issues Requiring Consensus	Complexity of Issues	2	ML
		Contentiousness of Issues	2	ML
		Lack of Opportunities for Agreement	3	MM
Self and Career Development	Need for Learning and Development	Self and Career Development Requirements	3	MM
	Limitations on Learning and Development Opportunities	Time, Resources, or Support Constraints	1	LO
		Application Constraints	2	ML

Tools and Equipment

Pressure gauges	Hand tools	Temperature gauges
Flashlight	Calibrated test gauges	Pumps
Electrical meter	Hand pumps	Radio
Writing utensils	PPE	Notepad
Watch	Sample bottles	Centrifuge
Hydrometer	Beakers	Gas sampling device
Hart communicator	Hoses	Valves
Sorbent pads	Buckets	Test devices
Locks and tags	Flagging tape	Signs
Car seals	Fire extinguisher	pH strips
Temperature sensing gun	Cables and chains	Lifting equipment
Tool belt or bag	Drivers	

Statement of Assessment

The assessment process should include one or more of the following:

A. Written tests could include:

- (1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
- (2) Graphic representations (e.g., P&IDs and loop drawings) that reveal an understanding of symbology and connections between processes and devices.
- (3) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge, skills and attitudes that could:

- (1) Represent a real life scenario, problem or challenging situation in the context of a work environment.
- (2) Apply relevant knowledge or skills.
- (3) Focus on the application of knowledge and skills to a new situation.
- (4) Demonstrate an ability to plan, organize and create a product or an event.
- (5) Illustrate by individual performance the attained levels of knowledge, skills and attitudes.
- (6) Include observation of events, groups and individuals that focuses on the relevant traits of the skill or attitude being observed.