Industrial Mechanics Criticality Survey - 2016

WORKPLACE READINESS STANDARDS

Personal Qualities and People Skills					
Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
Demonstrate a positive work ethic by coming to work every day on time, a willingness to take direction, and motivation to accomplish the task at hand.	0	0	18	3.00	18
Demonstrate integrity by abiding by workplace policies and laws and demonstrating honesty and reliability.	0	3	15	2.83	18
Demonstrate teamwork skills by contributing to the success of the team, assisting others, and requesting help when needed.	0	7	11	2.61	18
Demonstrate positive self-representation skills by dressing appropriately and using language and manners suitable for the workplace.	1	10	7	2.33	18
Demonstrate diversity awareness by working well with all customers and co-workers.	1	6	11	2.56	18
Demonstrate conflict-resolution skills by negotiating diplomatic solutions to interpersonal and workplace issues.	3	6	9	2.33	18

Demonstrate creativity and resourcefulness by contributing new ideas and working with initiative.	2	8	8	2.33	18
				answered question	**18**
				skipped question	**1**

Professional Knowledge and Skills					
Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
Demonstrate effective speaking and listening skills by communicating effectively with customers and employees and following directions.	2	7	9	2.39	18
Demonstrate effective reading and writing skills by reading and interpreting workplace documents and writing clearly.	3	6	9	2.33	18
Demonstrate critical-thinking and problem-solving skills by analyzing and resolving problems that arise in completing assigned tasks.	0	5	13	2.72	18
Demonstrate healthy behaviors and safety skills by following safety guidelines and managing personal health.	0	6	12	2.67	18
Demonstrate understanding of workplace organizations, systems, and climates by identifying "big picture" issues and fulfilling the mission of the workplace.	5	8	4	1.94	17
Demonstrate lifelong-learning skills by continually acquiring new industry-related information and improving professional skills.	5	10	3	1.89	18

Demonstrate job acquisition and advancement skills by preparing to apply for a job and seeking promotion.	12	4	2	1.44	18
Demonstrate time, task, and resource management skills by organizing and implementing a productive plan of work.	4	11	3	1.94	18
Demonstrate mathematical skills by using mathematical reasoning to accomplish tasks	6	6	6	2.00	18
Demonstrate customer service skills by identifying and addressing the needs of all customers and providing helpful, courteous, and knowledgeable service.	4	8	6	2.11	18
				answered question	**18**
				skipped question	**1**

Technology Knowledge and Skills					
Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
Demonstrate proficiency with job-specific technologies by selecting and safely using technological resources to accomplish work responsibilities in a productive manner.	0	9	9	2.50	18
Demonstrate proficiency with information technology by using computers, file management techniques, and software/programs effectively.	4	6	8	2.22	18
Demonstrate proper Internet use and security by using the Internet appropriately for work.	6	8	4	1.89	18

Demonstrate proficiency with telecommunications by selecting and using appropriate devices, services, and applications.	7	9	1	1.65	17
				answered question	**18**
				skipped question	**1**

CONTENT STANDARD 1: SAFETY

	Performance Standard 1.1: Shop Safety					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
1.1.1.	Explain the idea of a safety culture and its importance to industrial maintenance.	0	3	15	2.83	18
1.1.2.	Identify causes of accidents and the impact of accident costs.	4	7	7	2.17	18
1.1.3.	Review worker's rights and responsibilities.	8	8	2	1.67	18
1.1.4.	Recognize hazard recognition and risk assessment techniques.	1	6	11	2.56	18
1.1.5.	Explain fall protection and ladder, stair and scaffold procedures and requirements.	2	9	6	2.24	17
1.1.6.	Identify equipment power sources.	1	5	12	2.61	18
1.1.7.	Knowledge of lock out and tag out procedures.	0	3	15	2.83	18
1.1.8.	Demonstrate safe work procedures to use around electrical hazards.	0	7	11	2.61	18
1.1.9.	Demonstrate the use and care of appropriate personal protective equipment (PPE).	0	4	14	2.78	18
1.1.10.	Explain the importance of hazard communications (HazCom) and Safety Data.	1	11	6	2.28	18

1.1.11.	Identify other construction hazards on your job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined	3	6	9	2.33	18
					answered question	**18**
					skipped question	**1**

CONTENT STANDARD 2: TECHNICAL DRAWINGS

	Performance Standard 2.1: Blueprints and Schematics					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
2.1.1.	Explain the purpose of blueprints.	6	9	3	1.83	18
2.1.2.	Explain and interpret machine parts and machine drawings.	2	10	6	2.22	18
2.1.3.	Develop sketches.	10	7	1	1.50	18
2.1.4.	Read and interpret schematics and symbols (i.e electrical, hydraulic, and welding).	2	10	6	2.22	18
					answered question	**18**
					skipped question	**1**

CONTENT STANDARD 3: SHOP SKILLS

	Performance Standard 3.1: Shop Skills					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
3.1.1.	Apply basic mathematical principles.	0	11	7	2.39	18
3.1.2.	Explain techniques of measurement, e.g. motion, fluids, electricity, and temperature.	1	13	4	2.17	18
3.1.3.	Explain the mechanical and chemical properties of ferrous and non-ferrous metals.	9	9	0	1.50	18
3.1.4.	Understand lean and continuous improvement manufacturing processes.	8	9	1	1.61	18
3.1.5.	Determine sequence of work on a specified project.	1	12	5	2.22	18
3.1.6.	Determine tolerances and finishes.	3	9	6	2.17	18
3.1.7.	Explain the variables that affect job efficiency.	5	11	2	1.83	18
3.1.8.	Demonstrate knowledge of record keeping practices.	7	9	2	1.72	18
3.1.9.	Complete a work order.	2	7	9	2.39	18
3.1.10.	Complete a requisition.	7	6	5	1.89	18
					answered question	**18**
					skipped question	**1**

CONTENT STANDARD 4: TOOLS

	Performance Standard 4.1: Shop Equipment					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
4.1.1.	Demonstrate use and maintenance of basic hand and power tools properly.	0	6	12	2.67	18
4.1.2.	Convert English/standard to metric.	9	7	2	1.61	18
4.1.3.	Demonstrate the ability to perform layout work.	7	9	2	1.72	18
4.1.4.	Demonstrate the use and care of test and safety equipment.	1	11	6	2.28	18
					answered question	**18**
					skipped question	**1**

CONTENT STANDARD 5: WELDING

	Performance Standard 5.1: Gas Welding/Cutting					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
5.1.1.	Set up gas welding and cutting equipment and accessories.	2	9	7	2.28	18
5.1.2.	Identify personal protective equipment required for welding and cutting.	0	3	15	2.83	18
5.1.3.	Demonstrate proper lighting, adjusting, and shutting down of a gas torch.	1	9	8	2.39	18
5.1.4.	Layout and cut mild steel.	3	9	6	2.17	18

5.1.5.	Braze/Solder miscellaneous materials.	7	7	4	1.83	18
					answered question	**18**
					skipped question	**1**

	Performance Standard 5.2: Arc Welding/Cutting					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
5.2.1.	Set up and adjust a variety of arc welders.	2	9	6	2.24	17
5.2.2.	Identify and select electrodes.	3	7	7	2.24	17
5.2.3.	Weld build-up pads and/or shafts or round surfaces	4	11	2	1.88	17
5.2.4.	Hard surface metals with S.M.A.W.	6	9	2	1.76	17
5.2.5.	Weld basic joints in flat, horizontal, and vertical positions.	1	6	10	2.53	17
					answered question	**17**
					skipped question	**2**

CONTENT STANDARD 6: ELECTRICITY & ELECTRONICS						
	Performance Standard 6.1: Elements of Electricity & Electronics					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
6.1.1.	Define common terms used in electricity and electronics.	2	11	4	2.12	17
6.1.2.	Discuss electrical safe work practices and the governing organizations.	3	8	6	2.18	17

6.1.3.	Describe theory and the industrial uses of magnets and electromagnets.	8	9	0	1.53	17
6.1.4.	Explain the purpose and use of transformers.	4	13	0	1.76	17
6.1.5.	Explain and apply Ohm's Law.	3	10	4	2.06	17
6.1.6.	Use instruments which measure current, resistance, and potential	2	9	6	2.24	17
6.1.7.	differences between AC/DC circuits.	3	8	6	2.18	17
6.1.8.	Demonstrate knowledge of the instruments used to measure electrical circuits.	2	8	7	2.29	17
6.1.9.	Know the difference between a single phase and a three phase circuit.	3	6	8	2.29	17
6.1.10.	Install, troubleshoot, and maintain electric motors.	4	6	7	2.18	17
6.1.11.	Demonstrate knowledge of troubleshooting procedures for electric circuits and control	4	10	3	1.94	17
6.1.12.	Understand the differences and properties between series and parallel circuits.	5	9	3	1.88	17
					answered question	**17**
					skipped question	**2**

CONTENT STANDARD 7: PREVENTIVE AND PREDICTIVE MAINTENANCE

	Performance Standard 7.1: Maintenance Scheduling					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
7.1.1.	Explain the function of lubricants.	1	9	6	2.31	16

7.1.2.	Explain the factors determining the selection of lubricants.	3	10	3	2.00	16
7.1.3.	Describe lubricating systems, including the charts and methods used.	3	12	1	1.88	16
7.1.4.	Demonstrate proper grease application.	2	9	5	2.19	16
7.1.5.	Practice lubrication on various equipment.	4	6	6	2.13	16
7.1.6.	Preventative maintenance scheduling and maintaining records.	4	6	6	2.13	16
7.1.7.	Know the preventive maintenance techniques of various equipment.	3	8	5	2.13	16
7.1.8.	Perform preventive maintenance on drive components.	3	2	11	2.50	16
7.1.9.	List rules for good bearing lubrication.	2	7	7	2.31	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 8: DRIVE COMPONENTS

	Performance Standard 8.1: Drive Component Installation and Maintenance					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
8.1.1.	Identify and understand various drive component couplings.	1	8	7	2.38	16
8.1.2.	Understand different type of power transfer methods.	1	11	4	2.19	16
8.1.3.	Understand use of shaft alignment techniques.	1	8	7	2.38	16
8.1.4.	Explain the function of gear boxes.	1	6	9	2.50	16

8.1.5.	Explain the function of drive sprockets and chains.	1	6	9	2.50	16
8.1.6.	Explain the function of sheaves and pulleys.	1	7	8	2.44	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 9: BEARINGS

	Performance Standard 9.1: Bearing Installation, Inspection and Repair					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
9.1.1.	Identify various bearing types and their applications.	0	10	6	2.38	16
9.1.2.	Identify and select bearing seals.	2	9	5	2.19	16
9.1.3.	Explain bearing load, wear patterns, & maintenance.	0	13	3	2.19	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 10: PUMPS

	Performance Standard 10.1: Pump Maintenance and Repair					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
10.1.1.	Determine pump capacity and system requirements.	3	11	1	1.87	15
10.1.2.	Identify packing and seal requirements.	1	14	0	1.93	15

10.1.3.	Explain the operating principles of various types of pumps, e.g. centrifugal, propeller and turbine rotary, reciprocating and metering pumps.	0	12	3	2.20	15
					answered question	**15**
					skipped question	**4**

CONTENT STANDARD 11: PIPING SYSTEMS

	Performance Standard 11.1: Piping Systems and Accessory Maintenance					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
11.1.1.	Identify the components of a piping system.	3	12	1	1.88	16
11.1.2.	Explain the maintenance features of piping systems.	4	10	2	1.88	16
11.1.3.	Explain valve operation and maintenance.	1	8	7	2.38	16
11.1.4.	Explain the use and maintenance of strainers, filters, and traps in piping systems.	1	10	5	2.25	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 12: HYDRAULIC SYSTEMS

	Performance Standard 12.1: Hydraulic Component Maintenance and Repair					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
12.1.1.	Explain laws and principles of hydraulic systems.	5	5	6	2.06	16

12.1.2.	Explain the characteristics and components of a hydraulic system.	3	6	7	2.25	16
12.1.3.	Identify hydraulic system components.	2	7	7	2.31	16
12.1.4.	Troubleshoot hydraulic systems.	2	7	7	2.31	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 13: PNEUMATIC SYSTEMS						
	Performance Standard 13.1: Pneumatic Component Maintenance and Repair					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
13.1.1.	Identify schematic symbols and diagrams used in pneumatic systems.	2	9	5	2.19	16
13.1.2.	Diagram an air supply system.	6	8	2	1.75	16
13.1.3.	Identify pneumatic system components.	3	4	8	2.33	15
13.1.4.	Explain pneumatic system maintenance techniques.	2	9	5	2.19	16
13.1.5.	Demonstrate pneumatic system troubleshooting procedures.	2	6	8	2.38	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 14: RIGGING SYSTEMS

	Performance Standard 14.1: Rigging					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
14.1.1.	Estimate the weight of a load.	2	9	5	2.19	16
14.1.2.	Find the center of gravity.	2	8	6	2.25	16
14.1.3.	Identify the rigging and slings used in maintenance work.	1	6	9	2.50	16
14.1.4.	Explain safety inspection procedures for rigging, ropes, and slings.	1	5	10	2.56	16
					answered question	**16**
					skipped question	**3**

CONTENT STANDARD 15: PROGRAMMABLE LOGIC CONTROLLERS

	Performance Standard 15.1: Programmable Logic Controllers					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
15.1.1.	Describe the function and purpose of a programmable logic controller (PLC).	3	8	4	2.07	15
15.1.2.	Analyze a binary logic network.	6	7	3	1.81	16
15.1.3.	Construct input/output (I/O) circuits.	5	7	4	1.94	16
15.1.4.	State the characteristics of the different types of memory.	6	7	3	1.81	16

15.1.5.	Identify and explain the features of relay ladder logic instruction categories.	6	6	4	1.88	16
15.1.6.	Explain the use and function of electrical and electronic control equipment.	5	6	5	2.00	16
15.1.7.	Explain the function of variable frequency drive (VFD).	3	8	5	2.13	16
					answered question	**15**
					skipped question	**4**

CONTENT STANDARD 16: MACHINE SHOP OPERATIONS						
	Performance Standard 16.1: Turning					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
16.1.1.	Identify the principal parts of a lathe.	10	6	0	1.38	16
16.1.2.	Demonstrate the use of a lathe and attachments.	10	6	0	1.38	16
16.1.3.	Bore and drill holes with a lathe.	10	6	0	1.38	16
16.1.4.	Cut threads with a lathe.	10	6	0	1.38	16
					answered question	**16**
					skipped question	**3**

	Performance Standard 16.2: Milling					
	Answer Options	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**	**Response Count**
16.2.1.	Identify types of milling machines and tooling.	7	9	0	1.56	16
16.2.2.	Select and set feeds and speeds for milling work.	8	8	0	1.50	16
16.2.3.	Perform a variety of milling operations.	10	6	0	1.38	16
					answered question	**16**
					skipped question	**3**