



Electrician

HISTORIC DACUM CHART FOR ELECTRICIAN

DACUM Panel

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Duty A: Perform Preventative Maintenance						
Tasks						
A-1 Obtain assigned work order	A-2 Review safety procedures	A-3 Review scheduled work procedures	A-4 Identify preventative tools and materials	A-5 Review preventative historical records with current findings	A-6 Review prints/diagrams	A-7 Conduct preventative maintenance service
A-8 Perform troubleshooting tests	A-9 Replace faulty components/units	A-10 Repair faulty components/units	A-11 Perform worksite clean-up activities			

Duty B: Perform Retrofit/New System Installations							
Tasks							
B-1 Perform worksite evaluation	B-2 Review safety procedures	B-3 Review specs and references	B-4 Prepare hazardous materials for transportation	B-5 Perform worksite preparation activities	B-6 Verify construction material lists	B-7 Review construction print(s) requirements	B-8 Spot materials/equipment on worksite
B-9 Coordinate support equipment activities	B-10 Dismantle pre-existing system	B-11 Complete construction/retrofit per specifications	B-12 Perform worksite clean-up activities				

Duty C: Perform Troubleshooting						
Tasks						
C-1 Obtain problem-specific documents (instructional manual, prints)	C-2 Obtain problem-specific test equipment	C-3 Assess parts/supplies for repair(s)	C-4 Gather problem-specific data	C-5 Obtain problem-specific clearances (take out of service)	C-6 Perform problem-specific troubleshooting techniques	C-7 Perform problem-specific repair(s)
C-8 Perform system/equipment test	C-9 Release problem-specific clearances (back into service)	C-10 Complete work order report	C-11 Present knowledge/problem findings to others			

14 SKILL STANDARDS FOR ENERGY INDUSTRY

Duty D: Perform Testing						
Tasks						
D-1 Review safety procedures	D-2 Perform visual checks	D-3 Perform operational check	D-4 Perform alarm testing	D-5 Perform power circuit breaker (PCB) testing	D-6 Perform purity of dielectric testing (SF6, oil, air, vacuum)	D-7 Perform tolerances testing
D-8 Perform Thermal imaging	D-9 Perform power factor testing	D-10 Perform vibration testing	D-11 Perform transformer testing	D-12 Perform insulation quality testing	D-13 Perform wire check	D-14 Perform acceptance testing
D-15 Perform high potential testing						

Duty E: Maintain Tools and Equipment			
Tasks			
E-1 Maintain calibration tools	E-2 Perform tool/equipment maintenance/inspection	E-3 Maintain tool control and security	E-4 Restock bins and equipment

Duty F: Maintain Documentation						
Tasks						
F-1 Maintain equipment records	F-2 Maintain work progress report (construction)	F-3 Maintain equipment test records	F-4 Document start-up procedures (commissioning)	F-5 Complete time sheets	F-6 Compete work orders	F-7 Update prints/diagrams
F-8 Compete accident reports	F-9 Complete and submit outage request					

Duty G: Maintain Parts and Supplies				
Tasks				
G-1 Review job specifications and references	G-2 Identify replacement parts/supplies	G-3 Complete ordering process	G-4 Receive and inspect orders	G-5 Maintain inventory control

ELECTRICIAN

Skill Standards

Template A

Summary of Highest Ranked Tasks for Electrician

Function/Duty A: Perform Preventative Maintenance

Tasks:

- A-2 Review safety procedures
- A-5 Review preventative historical records with current findings
- A-6 Review prints/diagrams
- A-7 Conduct preventative maintenance service
- A-11 Perform worksite clean-up activities

Function/Duty B: Perform Retrofit/New System Installations

Tasks:

- B-2 Review safety procedures
- B-3 Review specs and references
- B-7 Review construction print(s) requirements
- B-8 Spot materials/equipment on worksite
- B-11 Complete construction/retrofit per specifications
- B-12 Perform worksite clean-up activities

Function/Duty C: Perform Troubleshooting

Tasks:

- C-1 Obtain problem-specific documents (instructional manual, prints)
- C-2 Obtain problem-specific test equipment
- C-4 Gather problem-specific data
- C-5 Obtain problem-specific clearances
- C-6 Perform problem-specific troubleshooting techniques
- C-11 Present knowledge/problem findings to others

Function/Duty D: Perform Testing

Tasks:

- D-1 Review safety procedures
- D-2 Perform visual checks
- D-7 Perform tolerances testing
- D-12 Perform insulation quality testing
- D-13 Perform wire check
- D-14 Perform acceptance testing

Function/Duty E: Maintain Tools and Equipment

Tasks:

- E-2 Perform tool/equipment maintenance/inspection

Function/Duty F: Maintain Documentation

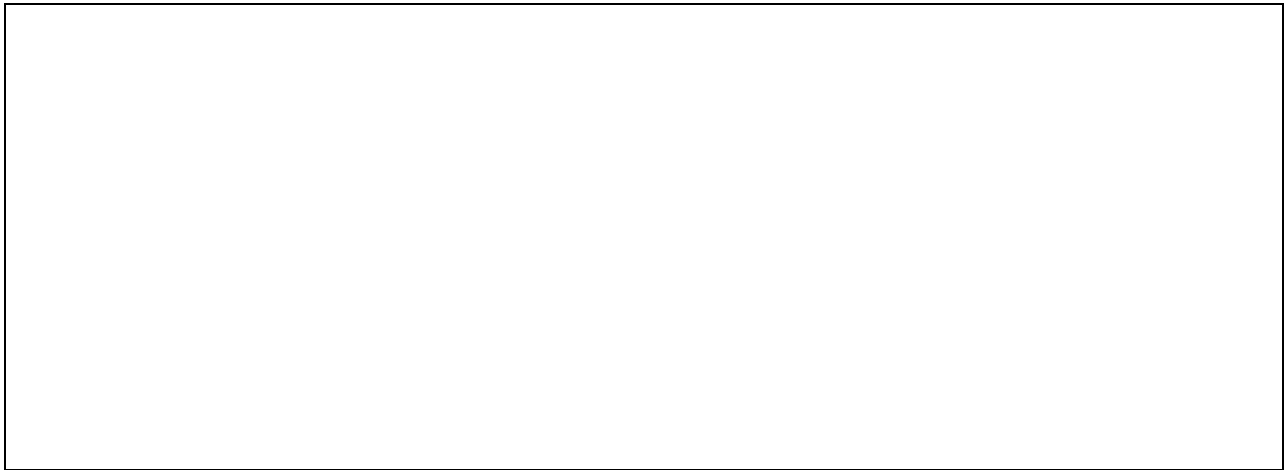
Tasks:

- F-1 Maintain equipment records
- F-6 Complete work orders
- F-7 Update prints/diagrams
- F-8 Complete accident reports

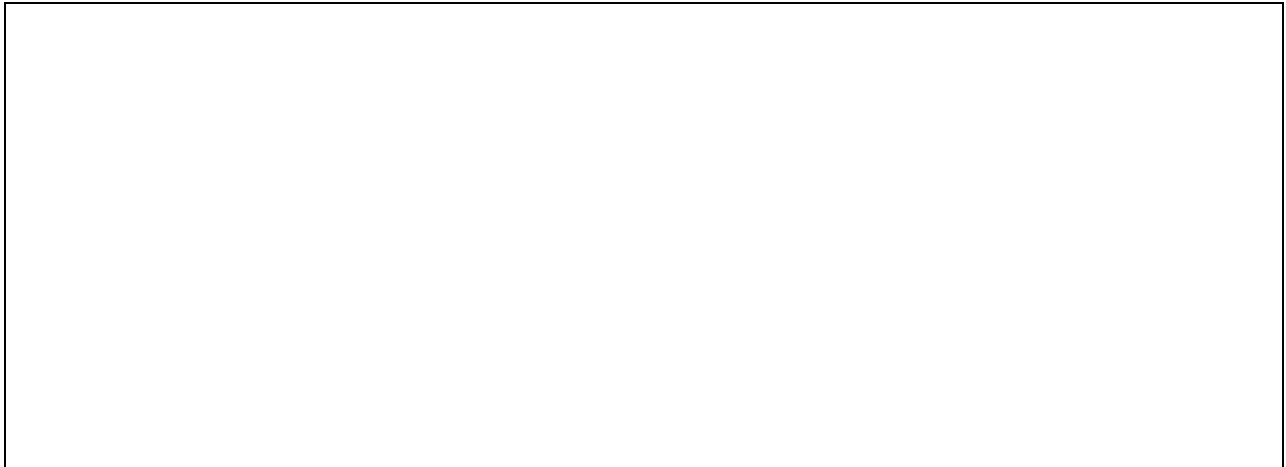
Function/Duty G: Maintain Parts and Supplies

Tasks:

- G-1 Review job specifications and references
- G-2 Identify replacement parts and supplies
- G-5 Maintain inventory control



Electrician Picture



Occupation Cluster: **Electrician**

Function or Job Duty: **Duty A: Perform Preventative Maintenance**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
A-2 Review safety procedures	<ul style="list-style-type: none"> All unsafe conditions are identified. All important information regarding job safety is communicated clearly and effectively. Conditions that present a threat to health, safety and the environment are identified, reported, and documented promptly. Corrective actions are identified. Ongoing safety concerns are tracked and reported until corrective action is taken. All technicians, operators and relevant personnel are notified of the organization's safety standards including OSHA/WISHA/OREGON OSHA. Safety procedures/standards are properly documented. Management is consulted to ensure procedures/standards are adequate and meet regulatory requirements. Isolation complete and accurate. 	<ul style="list-style-type: none"> Organization/OSHA/WISHA/ OREGON OSHA requirements. Identifying critical areas of job safety. Recognizing unsafe conditions/ practices. Employer's job safety procedures. Safety issues and unsafe conditions. Documentation and reporting procedures. Corrective actions. System/component interrelationships. Local clearance procedures. 	<ul style="list-style-type: none"> Adheres to standards. Presents complex ideas/information. Models proper performance/attitudes. Interprets, clarifies and influences communication between agencies/personnel. Monitor performance standards and follow up on assigned key activities. Records information accurately, prepares messages and writes concise safety procedures.
A-5 Review preventative historical records with current findings	<ul style="list-style-type: none"> Technician/Operator and their logs are consulted to determine the nature of the problem. Equipment repair and diagnostics reports are checked for previous problems. Equipment is checked to identify problems. Appropriate and accurate sources of information are consulted such as prints, OEM manuals, process diagrams, etc. All safety procedures are followed. 	<ul style="list-style-type: none"> Recognizing and categorizing problems. Equipment/machine operations and functions. Operator/technician logs and equipment repair and diagnostics reports. Checking the safety of the equipment. Sources of equipment-specific information. Vendor equipment and employer's terms and terminology. 	<ul style="list-style-type: none"> Recognizes system strengths/limitations. Identifies the problem, analyzes possible causes/reasons, evaluates solutions and devises action plan. Identifies relevant details, facts, specifications, follows set of instructions. Translates and interprets blueprints, drawings, diagrams. Presents answers/ conclusions in a clear and understandable form.
A-6 Review prints/ diagrams	<ul style="list-style-type: none"> Job needs are expressed concisely and accurately. Materials and parts are verified against vendor specifications prior to initiating work, project or job. Accurate blueprints, specifications and documentation are available and checked for completeness and modified as necessary. Plan is reviewed for timelines, equipment, and personnel required to do the job. Qualified technicians are asked appropriate questions to determine needs. Repair histories are reviewed to determine current repair needs. 	<ul style="list-style-type: none"> Vendors and contacts within vendors. Developing blueprints, specifications and documentation. Interpreting specifications and schematics. Equipment and the time and personnel required to complete the work or job. Availability of materials, personnel and vendors. Safety and quality issues. 	<ul style="list-style-type: none"> Selects data relevant to the task. Interprets and provides accurate information, prepares basic summaries and reports. Translates and interprets blueprints, drawings and specifications. Acquires supplies and equipment, orders and maintains inventory, and monitors safe and efficient utilization of materials.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty A: Perform Preventative Maintenance**

TASK	Performance Criteria	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
A-7 Conduct preventative maintenance service	<ul style="list-style-type: none"> • Lockout/tag-out/clearance procedures are followed. • Plan is developed which includes timeline, equipment, and personnel required to do the job. • All required permits are obtained and all laws and regulations are followed. • The proper workers are scheduled to ensure effectiveness, efficiency and safety. • All requirements, quality and performance expeditions are communicated to team/crew in an effective manner before work is started. 	<ul style="list-style-type: none"> • Special tools and parts. • Locate information regarding retooled parts and manufacturers' and employer's specifications. • Part ordering procedures. • Use math skills to solve problems. • Existing preventative maintenance (PM) protocols and PM sheets. • Special test or procedures methodologies and instruments. 	<ul style="list-style-type: none"> • Identifies relevant details, facts, specifications and follows set of instructions. • Understands technology applications. • Manipulate technology for desired results. • Acquires supplies and equipment. • Utilizes integrated software, locates and retrieves stored information. • Reports results.
A-11 Perform worksite clean-up activities	<ul style="list-style-type: none"> • Proper equipment is correctly and safely operated in accordance with laws, regulations, and organization procedures. • Correct cleanup procedures are thoroughly followed. • Correct containers are used for each type of material and correctly labeled for transportation. • Appropriate documentation is completed. • Containers are loaded in accordance with proper procedures. • Problems with carrying hazardous materials are communicated in advance with all parties. • Returns tools and equipment to proper storage. 	<ul style="list-style-type: none"> • Safety procedures and personal protective equipment. • Various hazardous materials and their dangers. • Chemical containers, their labels, uses, and inspection procedures. • Spill clean up procedures. • Correct lifting and pushing procedures. • Documentation procedures. • Housekeeping procedures. • Tool/equipment maintenance requirements. 	<ul style="list-style-type: none"> • Monitors performance standards and procedures. • Records information accurately, prepares messages and writes simple documents. • Interpret chemical use/hazardous material symbols/labels. • Communicate appropriate verbal and/or non-verbal messages. • Generate and evaluate solutions and implement plan(s) of action.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty B: Perform Retrofit/New System Installations**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
B-2 Review safety procedures	<ul style="list-style-type: none"> All unsafe conditions are identified. All important information regarding job safety is communicated clearly and effectively. Conditions that present a threat to health, safety and the environment are identified, reported, and documented promptly. Corrective actions are identified. Ongoing safety concerns are tracked and reported until corrective action is taken. All technicians, operators and relevant personnel are notified of the organization's safety standards including OSHA/WISHA/OREGON OSHA. Safety procedures/standards are properly documented. Management is consulted to ensure procedures/standards are adequate and meet regulatory requirements. Proper PPE is worn. Isolation complete and accurate. 	<ul style="list-style-type: none"> Organization/OSHA/WISHA/OREGON OSHA requirements. Identifying critical areas of job safety. Recognizing unsafe conditions/practices. Employer's job safety procedures. Safety issues and unsafe conditions. Documentation and reporting procedures. Corrective actions. System interrelationships. Local clearance procedures. 	<ul style="list-style-type: none"> Adheres to standards. Presents complex ideas/information. Models proper performance/attitudes. Interprets, clarifies and influences communication between agencies/personnel. Monitor performance standards and follow up on assigned key activities. Records information accurately, prepares messages and writes concise safety procedures. Identifies proper Personal Protective Equipment (PPE).
B-3 Review specs and references	<ul style="list-style-type: none"> Reference materials are consulted to accurately determine construction specifications. Customer needs and resources are solicited, assessed, and incorporated into the construction. Total construction aspects are accurately seen and included in the construction/update plan. Construction site is neat and concise and is professionally presented to the customer for approval. Assesses supporting information sources. 	<ul style="list-style-type: none"> Skill levels required for the work, and personnel possessing those skills. Using tools and equipment required to perform the tasks. Applying proper methods. Safety checks, safety procedures and personal protective equipment. Equipment and vendor terminology. Time management. 	<ul style="list-style-type: none"> Pays attention to detail and translates and interprets blueprints, drawings and diagrams. Visually analyzes relationship between parts/whole, process/procedure. Prepare a plan, prioritize daily tasks and monitor/adjust task sequence. Shares work assignments, matches talent to positions and delegates responsibilities.
B-7 Review construction print(s) requirements	<ul style="list-style-type: none"> Job needs are expressed concisely and accurately. Materials and parts are verified against vendor specifications prior to initiating work, project or job. Accurate blueprints, specifications and documentation are available and checked for completeness and modified as necessary. Qualified technicians are asked appropriate questions to determine needs. Repair histories are reviewed to determine current repair needs. 	<ul style="list-style-type: none"> Vendors and contacts within vendor's organization. Read/Developing blueprints, specifications and documentation. Interpreting specifications and schematics. Equipment and the time and personnel required to complete the work or job. Availability of materials, access compatibility. Safety and quality issues. 	<ul style="list-style-type: none"> Selects data relevant to the task. Interprets and provides accurate information, prepares basic summaries and reports. Translates and interprets blueprints, drawings and specifications. Acquires supplies and equipment, orders and maintains inventory, and monitors safe and efficient utilization of materials.

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Function or Job Duty: **Duty B: Perform Retrofit/New System Installations**

TASK	Performance Criteria	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
B-8 Spot materials/equipment on worksite	<ul style="list-style-type: none"> • Special materials/tools and parts are located. • All required materials/tools for the job are assembled at the work site. • Where applicable, certification of tools is verified. • Materials/tools are checked to ensure they are in safe and proper working order. • Procedures regarding nonfunctioning tools are followed. • Follow organization/OSHA/WISHA/OREGON OSHA standards as they relate to the industry for job-site safety. 	<ul style="list-style-type: none"> • Special materials/tools and parts. • Information regarding retooled parts and manufacturers' and employer's specifications. • How tools should work. • Part ordering procedures. • Maintenance staffing schedules and skills. • Procedures regarding non-functioning tools. • Working safely and using safe work practices. • Occupational hazards and standard safety devices. 	<ul style="list-style-type: none"> • Identifies relevant details, facts and specifications and follows set of instructions. • Monitor performance standards and follow up on assigned key activities. • Manipulates technology for desired results and analyzes technology output. • Acquires supplies and equipment. • Utilizes integrated software, locates and retrieves stored information.
B-11 Complete construction/retrofit per specifications	<ul style="list-style-type: none"> • Reference materials are consulted to accurately determine construction specifications. • Needs and resources are solicited, assessed, and incorporated into the construction. • Construction site is neat and concise and is ready for approval/use. • Proper PPE is worn. 	<ul style="list-style-type: none"> • Skill levels required for the work, and personnel possessing those skills. • Using tools and equipment required to perform the construction. • Construction preparation requirements. • Applying proper construction methods. • Safety checks, safety procedures and personal protective equipment. • Equipment and vendor terminology. • Time management. • Use math skills to solve problems. 	<ul style="list-style-type: none"> • Pays attention to detail and translates and interprets blueprints, drawings and diagrams. • Visually analyzes relationship between parts/whole, process/procedure. • Prepare construction schedule, prioritize daily tasks and monitor/adjust task sequence. • Distributes work assignments, matches talent to positions and delegates responsibilities.
B-12 Perform worksite clean-up activities	<ul style="list-style-type: none"> • Proper equipment is correctly and safely operated in accordance with laws, regulations, and organization procedures. • Correct cleanup procedures are thoroughly followed. • Correct containers are used for each type of material and correctly labeled for transportation. • Appropriate documentation is completed. • Containers are loaded in accordance with proper procedures. • Problems with carrying hazardous materials are communicated in advance with all parties. • Returns equipment to proper storage. 	<ul style="list-style-type: none"> • Safety procedures and personal protective equipment. • Various hazardous materials and their dangers. • Chemical containers, their labels, uses, and inspection procedures. • Spill clean up procedures. • Correct lifting and pushing procedures. • Documentation procedures. • Housekeeping procedures. • Tool/equipment maintenance requirements. 	<ul style="list-style-type: none"> • Monitors performance standards and procedures. • Records information accurately, prepares messages and writes simple documents. • Interpret chemical use/hazardous material symbols/labels. • Communicate appropriate verbal and/or non-verbal messages. • Generate and evaluate solutions and implement plan(s) of action.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty C: Perform Troubleshooting**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
C-1 Obtain problem-specific documents	<ul style="list-style-type: none">• Research of appropriate documents is optimized and completed in a timely manner.• Requests (forms)/paperwork are completed and submitted to appropriate parties in accordance with employer's procedures.• Documents received are processed and distributed to appropriate personnel/parties.• Backup copies are catalogued and filed for future reference and distribution.	<ul style="list-style-type: none">• Organization/employer's procedures.• Employer's resources to obtain documents.• Procedures for requesting and submitting requests for accessing relevant sources of information.• Labeling and filing procedures for reference materials/documents.	<ul style="list-style-type: none">• Follows rules, procedures, and policies.• Identify and obtain information/documentation relevant to task.• Recognize system strengths/limitations.• Uses appropriate materials as specified, understands technical words, follows written directions.• Communicate clearly.• Integrates systems technology/personnel resources.
C-2 Obtain problem-specific test equipment	<ul style="list-style-type: none">• Special materials/tools and parts are located.• All required materials/tools for the job are assembled at the work site.• Where applicable, certification of tools is verified.• Materials/tools are checked to ensure they are in safe and proper working order.• Procedures regarding nonfunctioning tools are followed.• Follow organization/OSHA/WISHA/OREGON OSHA standards as they relate to the industry for job-site safety.	<ul style="list-style-type: none">• Special materials/tools and parts.• Information regarding retooled parts and manufacturers' and employer's specifications.• How tools should work.• Part ordering procedures.• Maintenance staffing schedules and skills.• Procedures regarding non-functioning tools.• Working safely and using safe work practices.• Occupational hazards and standard safety devices.	<ul style="list-style-type: none">• Identifies relevant details, facts and specifications and follows set of instructions.• Monitor performance standards and follow up on assigned key activities.• Manipulates technology for desired results and analyzes technology output.• Acquires supplies and equipment.• Utilizes integrated software, locates and retrieves stored information.
C-4 Gather problem-specific data	<ul style="list-style-type: none">• Technician/Operator and their logs are consulted to determine the nature of the problem.• Equipment repair and diagnostics reports are checked for previous problems.• Equipment is checked to identify problems.• Appropriate and accurate sources of information are consulted such as prints, OEM manuals, process diagrams, etc.• All safety procedures are followed.• Assess supporting information sources.	<ul style="list-style-type: none">• Recognizing and categorizing problems.• Equipment/machine operations and functions.• Operator/technician logs and equipment repair and diagnostics reports.• Checking the safety of the equipment.• Sources of equipment-specific information.• Vendor equipment and employer's terms and terminology.• Use math skills to solve problems.	<ul style="list-style-type: none">• Monitors system performance.• Identifies the problem, analyzes possible causes/reasons, evaluates solutions and devises action plan.• Identifies relevant details, facts, specifications, follows set of instructions.• Translates and interprets blueprints, drawings, diagrams.• Utilizes integrated/multiple software and locates and retrieves stored information.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty C: Perform Troubleshooting**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
C-5 Obtain problem-specific clearances	<ul style="list-style-type: none"> • Lockout/ tag-out/clearance procedures are followed. • Plan is developed which includes timeline, equipment, and personnel required to do the job. • All required permits are obtained and all laws and regulations are followed. • The proper workers are scheduled to ensure effectiveness, efficiency and safety. • All requirements, quality and performance expeditions are communicated to team/crew in an effective manner before work is started . • Isolation complete and accurate. 	<ul style="list-style-type: none"> • Special tools and parts. • Locating information regarding retooled parts and manufacturers' and employer's specifications. • Maintenance staffing schedules and skills. • Existing preventative maintenance (PM) protocols and PM sheets. • System interrelationships. • Local clearance procedures. 	<ul style="list-style-type: none"> • Identifies relevant details, facts, specifications, follows set of instructions. • Understands technology applications. • Manipulate technology for desired results. • Acquires supplies and equipment. • Utilizes integrated software, locates and retrieves stored information.
C-6 Perform problem-specific troubleshooting techniques	<ul style="list-style-type: none"> • Appropriate identification process is used to determine potential problems. • All contributing factors are considered when determining potential problems, including operator logs and equipment, repair and diagnostic reports. • Appropriate tests and inspections are performed on failed components and repeated if necessary. • Data gathered through diagnostic procedures is analyzed to develop a hypothesis regarding possible causes. • Procedure for isolating problems is initiated correctly and followed through completely. • All safety procedures are followed. 	<ul style="list-style-type: none"> • Identification processes, tests and inspections for failed components. • Normal and abnormal equipment behavior and operations and manufacturers' performance specifications. • Nature and possible causes of failure. • Diagnostic tests and test equipment and ability to disassemble equipment. • Safety procedures and personal protective equipment. • Select systematic process best for task. 	<ul style="list-style-type: none"> • Monitors system performance. • Identifies relevant details, facts, specifications, follows set of instructions and qualifies/analyzes information. • Troubleshoots malfunction/ failure, and diagnoses performance deviations. • Selects data relevant to the task, predicts outcomes and analyzes data. • Prioritizes daily tasks, and monitors and adjusts task sequence.
C-11 Present knowledge/ Problem findings to others	<ul style="list-style-type: none"> • Communication is clear, accurate and effective and is conducted on an ongoing basis. • Suggestions are properly documented and include all supporting materials. • Suggestions are based on appropriate and accurate data or observations made during operation of equipment and repairs. • The need for changes in procedure is clearly communicated and recommendations are thoroughly discussed. • Any safety problems are identified and corrected with appropriate personnel. 	<ul style="list-style-type: none"> • Prioritizing and identifying urgent problems. • Urgent problems and unsafe conditions. • Normal and abnormal equipment operation. • Safety procedures and personal protective equipment. • Documentation procedures. • Long-term affects of repair/replace decisions. 	<ul style="list-style-type: none"> • Understands the requirements of the task/technological results and analyzes task/technology relationship. • Analyzes possible causes/reasons, evaluates solutions and devises action plan. • Uses logic to draw conclusions. • Suggests system modifications/improvements

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Function or Job Duty: **Duty D: Perform Testing**

TASK	Performance Criteria	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
D-1 Review safety procedures	<ul style="list-style-type: none"> • All unsafe conditions are identified. • All important information regarding job safety is communicated clearly and effectively. • Conditions that present a threat to health, safety and the environment are identified, reported, and documented promptly. • Corrective actions are identified. • Ongoing safety concerns are tracked and reported until corrective action is taken. • All technicians, operators and relevant personnel are notified of the organization's safety standards including OSHA/WISHA/OREGON OSHA. • Safety procedures/standards are properly documented. • Management is consulted to ensure procedures/standards are adequate and meet regulatory requirements. 	<ul style="list-style-type: none"> • Organization/OSHA/WISHA/OREGON OSHA requirements. • Identifying critical areas of job safety. • Recognizing unsafe conditions/practices. • Employer's job safety procedures. • Safety issues and unsafe conditions. • Documentation and reporting procedures. • Corrective actions. • System interrelationships. 	<ul style="list-style-type: none"> • Adheres to standards. • Presents complex ideas/information. • Models proper performance/attitudes. • Interprets, clarifies and influences communication between agencies/personnel. • Monitor performance standards and follow up on assigned key activities. • Records information accurately, prepares messages and writes concise safety procedures. • Identifies proper PPE.
D-2 Perform visual checks	<ul style="list-style-type: none"> • Review previous maintenance and testing reports/records. • The required parts, tools and equipment are gathered prior to testing and are used to perform work safely and efficiently. • Identify and use safety techniques established for the use of test and advanced testing equipment. • OSHA/WISHA/OREGON OSHA standards as they relate to the electrical trades for job site safety are followed, including the use of personal protective equipment. • Identify/comply with lockout/tag-out/clearance procedures, where applicable. • Interpretations and questions on materials, specification and diagnostics results are discussed and resolved. • Suggestions for improvements in work/test methods and procedures in testing products are shared and implemented. 	<ul style="list-style-type: none"> • Required parts, tools, and equipment to complete work/testing. • Institute of Electrical and Electronics Engineers (IEEE) Standards, National Electrical Code (NEC) and local codes. • Safety procedures and personal protective equipment to use when working or testing. • Ability to gather, interpret and use information from equipment manuals. • Proper equipment and electrical trade terminology. • Type of information included in electrical specifications. • Identifying and interpreting symbols used in electrical drawings. • Normal and abnormal equipment behavior and their effect on testing. • Analyzing testing results and process data to completing the job. • Lockout/tag-out/clearance procedures. • Recognizing unsafe job/working conditions. • Documentation and verification procedures and procedures for revising testing process. • Housekeeping procedures. 	<ul style="list-style-type: none"> • Identify relevant details, facts and specifications, and follow a set of instructions. • Monitors system performance. • Understands electrical wiring diagrams, schematics, and plans. • Identifies and corrects malfunctions and failures and evaluates performance • Good understanding of the operation of the equipment in order to make adjustments to meet specifications. • Distinguish trends in performance and diagnose performance deviations. • Develops and applies creative solutions to new and existing situations. • Summarizes and translates test data. • Interprets and provides accurate information and prepares basic summaries and reports. • Uses logic to draw conclusions.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty D: Perform Testing**

TASK	Performance Criteria	Technical Knowledge of	SCANS Skills and Personal Qualities
	How do we know when the task is performed well?	Skills, Abilities, Tools	Foundational Abilities
D-7 Perform tolerance testing	<ul style="list-style-type: none"> Review previous maintenance and testing reports/records. The required parts, tools and equipment are gathered prior to testing and are used to perform work safely and efficiently. Identify and use safety techniques established for the use of test and advanced testing equipment. OSHA/WISHA/OREGON OSHA standards as they relate to the electrical trades for job site safety are followed, including the use of personal protective equipment. Identify/comply with lockout/tag-out/clearance procedures, where applicable. Interpretations and questions on materials, specification and diagnostics results are discussed and resolved. Test procedures and methods are properly performed and test results are correctly interpreted. Equipment tests indicate that equipment performs to specification and meets operating standards. Suggestions for improvements in work/test methods and procedures in testing products are shared and implemented. Test results are documented and verified according to organization or manufacturer's procedures. Documentation is maintained according to policy and procedures, and submitted to correct parties for processing. Housekeeping is performed when work/testing is finished. 	<ul style="list-style-type: none"> Required parts, tools, and equipment to complete work/testing. Institute of Electrical and Electronics Engineers (IEEE) Standards, National Electrical Code (NEC) and local codes. Safety procedures and personal protective equipment to use when working or testing. Ability to gather, interpret and use information from equipment manuals. Proper equipment and electrical trade terminology. Digital test equipment and the software programs associated with the test equipment. Type of information included in electrical specifications. Electrical theories as they related to testing, troubleshooting and repair of electrical service. Identifying and interpreting symbols used in electrical drawings. Normal and abnormal equipment behavior and their effect on testing. Analyzing testing results and process data to completing the job. Lockout/tag-out/clearance procedures. Recognizing unsafe job/working conditions. Documentation and verification procedures and procedures for revising testing process. Housekeeping procedures. 	<ul style="list-style-type: none"> Identify relevant details, facts and specifications, and follow a set of instructions. Monitors system performance. Understands electrical wiring diagrams, schematics, and plans. Identifies and corrects malfunctions and failures and evaluates performance Good understanding of the operation of the equipment in order to make adjustments to meet specifications. Distinguish trends in performance and diagnose performance deviations. Develops and applies creative solutions to new and existing situations. Summarizes and translates test data. Interprets and provides accurate information and prepares basic summaries and reports. Understands computer operation and utilizes integrated software.

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Function or Job Duty: **Duty D: Perform Testing**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
D-12 Perform insulation quality testing	<ul style="list-style-type: none">• Review previous maintenance and testing reports/records.• The required parts, tools and equipment are gathered prior to testing and are used to perform work safely and efficiently.• Identify and use safety techniques established for the use of test and advanced testing equipment.• OSHA/WISHA/OREGON OSHA standards as they relate to the electrical trades for job site safety are followed, including the use of personal protective equipment.• Identify/comply with lockout/tag-out/clearance procedures, where applicable.• Interpretations and questions on materials, specification and diagnostics results are discussed and resolved.• Test procedures and methods are properly performed and test results are correctly interpreted. Equipment tests indicate that equipment performs to specification and meets operating standards.• Test results are documented and verified according to organization or manufacturer's procedures.• Documentation is maintained according to policy and procedures, and submitted to correct parties for processing.• Housekeeping is performed when work/testing is finished.	<ul style="list-style-type: none">• Required parts, tools, and equipment to complete work/testing.• Institute of Electrical and Electronics Engineers (IEEE) Standards, National Electrical Code (NEC) and local codes.• Safety procedures and personal protective equipment to use when working or testing.• Ability to gather, interpret and use information from equipment manuals.• Proper equipment and electrical trade terminology.• Type of information included in electrical specifications.• Electrical theories as they related to testing, troubleshooting and repair of electrical service.• Identifying and interpreting symbols used in electrical drawings.• Normal and abnormal equipment behavior and their effect on testing.• Analyzing testing results and process data to completing the job.• Lockout/tag-out/clearance procedures.• Recognizing unsafe job/working conditions.• Documentation and verification procedures and procedures for revising testing process.• Housekeeping procedures.	<ul style="list-style-type: none">• Identify relevant details, facts and specifications, and follow a set of instructions.• Understands electrical wiring diagrams, schematics, and plans.• Identifies and corrects malfunctions and failures and evaluates performance• Distinguish trends in performance and diagnose performance deviations.• Develops and applies creative solutions to new and existing situations.• Summarizes and translates test data.• Interprets and provides accurate information and prepares basic summaries and reports.• Understands computer operation and utilizes integrated software.

Occupation Cluster: Electrician

Function or Job Duty: Duty D: Perform Testing

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
D-13 Perform wire check	<ul style="list-style-type: none">• Identify and use safety techniques established for the use of test and advanced testing equipment.• OSHA/WISHA/OREGON OSHA standards as they relate to the electrical trades for job site safety are followed, including the use of personal protective equipment.• Identify/comply with lockout/tag-out/clearance procedures, where applicable.• Test procedures and methods are properly performed and test results are correctly interpreted. Equipment tests indicate that equipment performs to specification and meets operating standards.• Suggestions for improvements in work/test methods and procedures in testing products are shared and implemented.• Test results are documented and verified according to organization or manufacturer's procedures.• Documentation is maintained according to policy and procedures, and submitted to correct parties for processing.• Housekeeping is performed when work/testing is finished.• Continuity (or lack of) confirmed.• No equipment problems.• Uses proper safety procedures.	<ul style="list-style-type: none">• Required parts, tools, and equipment to complete work/testing.• Institute of Electrical and Electronics Engineers (IEEE) Standards, National Electrical Code (NEC) and local codes.• Safety procedures and personal protective equipment to use when working or testing.• Ability to gather, interpret and use information from equipment manuals.• Proper equipment and electrical trade terminology.• Type of information included in electrical specifications.• Electrical theories as they related to testing, troubleshooting and repair of electrical service.• Identifying and interpreting symbols used in electrical drawings.• Normal and abnormal equipment behavior and their effect on testing.• Analyzing testing results and process data to completing the job.• Lockout/tag-out/clearance procedures.• Recognizing unsafe job/working conditions.• Documentation and verification procedures and procedures for revising testing process.• Housekeeping procedures.	<ul style="list-style-type: none">• Identify relevant details, facts and specifications, and follow a set of instructions.• Monitors system performance.• Understands electrical wiring diagrams, schematics, and plans.• Identifies and corrects malfunctions and failures and evaluates performance• Good understanding of the operation of the equipment in order to make adjustments to meet specifications.• Distinguish trends in performance and diagnose performance deviations.• Develops and applies creative solutions to new and existing situations.• Interprets and provides accurate information and prepares basic summaries and reports.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty D: Perform Testing**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
D-14 Perform acceptance testing	<ul style="list-style-type: none">• The required parts, tools and equipment are gathered prior to testing and are used to perform work safely and efficiently.• Identify and use safety techniques established for the use of test and advanced testing equipment.• OSHA/WISHA/OREGON OSHA standards as they relate to the electrical trades for job site safety are followed, including the use of personal protective equipment.• Identify/comply with lockout/tag-out/clearance procedures, where applicable.• Interpretations and questions on materials, specification and diagnostics results are discussed and resolved.• Test procedures and methods are properly performed and test results are correctly interpreted. Equipment tests indicate that equipment performs to specification and meets operating standards.• Suggestions for improvements in work/test methods and procedures in testing products are shared and implemented.• Test results are documented and verified according to organization or manufacturer's procedures.• Documentation is maintained according to policy and procedures, and submitted to correct parties for processing.• Housekeeping is performed when work/testing is finished.	<ul style="list-style-type: none">• Required parts, tools, and equipment to complete work/testing.• Safety procedures and personal protective equipment to use when working or testing.• Ability to gather, interpret and use information from equipment manuals.• Proper equipment and electrical trade terminology.• Digital test equipment and the software programs associated with the test equipment.• Type of information included in electrical specifications.• Electrical theories as they related to testing, troubleshooting and repair of electrical service.• Identifying and interpreting symbols used in electrical drawings.• Normal and abnormal equipment behavior and their effect on testing.• Analyzing testing results and process data to completing the job.• Lockout/tag-out/clearance procedures.• Recognizing unsafe job/working conditions.• Documentation and verification procedures and procedures for revising testing process.• Housekeeping procedures.	<ul style="list-style-type: none">• Identify relevant details, facts and specifications, and follow a set of instructions.• Monitors system performance.• Understands electrical wiring diagrams, schematics, and plans.• Identifies and corrects malfunctions and failures and evaluates performance• Distinguish trends in performance and diagnose performance deviations.• Develops and applies creative solutions to new and existing situations.• Summarizes and translates test data.• Interprets and provides accurate information and prepares basic summaries and reports.• Understands computer operation and utilizes integrated software.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty E: Maintain Tools and Equipment**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
E-2 Perform tool/ equipment maintenance/ inspection	<ul style="list-style-type: none">• Equipment/tool, repair and diagnostics reports are checked for previous problems.• Repair histories are reviewed to see if correct repairs were done in the past.• Repair histories are reviewed to determine current repair needs.• Qualified technicians are asked appropriate questions to determine needs.• An historical trend of data is created by periodic data collection on equipment/tools.	<ul style="list-style-type: none">• Equipment and tool histories.• Equipment and tool repair histories.• Equipment and tool wear and tear.• Equipment and tool operation parameters.• Normal and abnormal tool/equipment behavior.• Locating and interpreting technician logs and equipment repair and diagnostics reports.• Locating sources of information regarding the equipment and tools.	<ul style="list-style-type: none">• Identifies and corrects malfunction/failures and evaluates performance of technology.• Identifies relevant details, facts, specifications and interprets information.• Interprets and provides accurate information and prepares basic summaries and reports.• Follows sets of instructions.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty F: Maintain Documentation**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
F-1 Maintain equipment test records	<ul style="list-style-type: none">• All test data have been accurately entered.• Test records are legible and up-to-date.• Records contain complete and detailed information including: tests procedures, test dates, test results, testing schedules, and identification of operator and/or technicians performing tests.	<ul style="list-style-type: none">• Information required in a complete test record.• Organization procedures for maintaining test records.• Test priorities and sharing test results.• Equipment and component operation and safety precautions.• Labels/tags are applied as required by organization.	<ul style="list-style-type: none">• Understands the system organization/hierarchy and follows processes/procedures.• Pays attention to detail and records information accurately.• Maintain legible written records.• Track testing results.• Use computer and input data accurately.• Communicate in written form.
F-6 Complete work orders	<ul style="list-style-type: none">• Equipment data has been accurately entered including model, machine, component serial numbers, and operation hours.• Safety and maintenance items are completely recorded.• Recommended repairs completed are documented.• Maintenance and repair items are accurately recorded and addressed.• Equipment and machine supplies used for repair are properly accounted for and recorded.• Documentation is kept in accordance with organization policies and regulations.	<ul style="list-style-type: none">• Information required on work order.• Where to locate information required for work order.• Recording information accurately and legibly.• Documentation procedures.• Organization policies and regulations regarding recordkeeping.	<ul style="list-style-type: none">• Identify and obtain data relevant to task.• Interpret symbols, diagrams, schematics, and analyze application.• Identify relevant details, facts, and specifications, and follow a set of instructions.• Describe repair work clearly in written form for future reference.• Use computer or data entry system.
F-8 Complete accident reports	<ul style="list-style-type: none">• Conditions that present a threat to health, safety and the environment are identified, reported, and documented promptly.• Organization health and safety representatives are consulted in the development of safety procedures.• Suggestions are made to correct procedures, according to employer's policies and regulations.• Corrective actions are taken promptly according to employer's procedures.• Ongoing safety concerns are tracked and reported until corrective action is taken.• Witnesses are interviewed.	<ul style="list-style-type: none">• Personal protective equipment (PPE) and its proper use.• Safety issues and unsafe conditions.• Safety, quality and productivity issues.• Documentation and reporting procedures.• Corrective actions.• Equipment operation and safety.• Equipment, quality, safety and productivity terminology.• Who to contact and proper forms.• Lost time/leave policies.	<ul style="list-style-type: none">• Adheres to standards.• Presents answers/ Suggests system modifications/ improvements.• Poses critical questions.• Records information accurately, prepares messages and writes concise safety procedures.

Occupation Cluster: **Electrician**

Function or Job Duty: **Duty G: Maintain Parts and Supplies**

TASK	Performance Criteria How do we know when the task is performed well?	Technical Knowledge of Skills, Abilities, Tools	SCANS Skills and Personal Qualities Foundational Abilities
G-1 Review job specifications and references	<ul style="list-style-type: none"> • Job needs are expressed concisely and accurately. • Materials and parts are verified against vendor specifications prior to initiating work, project or job. • Accurate blueprints, specifications and documentation are available and checked for completeness and modified as necessary. • Plan is reviewed for timelines, equipment, and personnel required to do the job. • Qualified technicians are asked appropriate questions to determine needs. • Repair histories are reviewed to determine current repair needs. 	<ul style="list-style-type: none"> • Vendors and contacts within vendors. • Developing blueprints, specifications and documentation. • Interpreting specifications and schematics. • Equipment and the time and personnel required to complete the work or job. • Availability of materials, personnel and vendors. • Safety and quality issues. • Realistic job expectations. 	<ul style="list-style-type: none"> • Selects data relevant to the task. • Interprets and provides accurate information, prepares basic summaries and reports. • Translates and interprets blueprints, drawings and specifications. • Acquires supplies and equipment, orders and maintains inventory, and monitors safe and efficient utilization of materials.
G-2 Identify replacement parts/supplies	<ul style="list-style-type: none"> • (Special) Tools and supplies are located. • Specialized tools required by the employer and purchased from the manufacturer or recommended vendor. • Retooled parts meet specifications. • Documentation and certifications are established and maintained as required. • If a part or supply is not available, follow-up occurs to ensure that adequate parts/supplies are maintained. 	<ul style="list-style-type: none"> • Special tools and supplies. • Part ordering procedure(s). • Use of tools/supplies and the tool/supply parameters. • Safety concerns regarding tool use. • Tool accuracy and signs of deterioration. • Retooled parts and manufacturers' and employer's specifications. • Documentation and certification. 	<ul style="list-style-type: none"> • Acquires supplies, equipment and materials in an efficient manner. • Identify relevant details, facts and specifications, and follow a set of instructions. • Monitors performance standards and follows up on assigned tasks. • Examine information/data for relevance and accuracy.
G-5 Maintain inventory control	<ul style="list-style-type: none"> • Inventory system is established to maintain inventory. • Inventory of parts and supplies needed to keep system in operation is maintained. • Parts and supplies purchased for inventory are of desired quality and quantity. • Inventory records are accurate and up-to-date. • Warranty items are handled according to manufacturer's and employer's instructions. 	<ul style="list-style-type: none"> • Vendor quality and service. • Evaluating parts and components for compatibility and suitability. • Utilizing computer database and parts and supplies ordering software. • Appropriate parts and supplies recordkeeping system. 	<ul style="list-style-type: none"> • Prepare warranty documents. • Identify relevant components and record information accurately. • Translate blueprints, drawings, and schematics. • Perform routine recordkeeping functions. • Maintain balanced accounts. • Identify future parts and supplies needed. • Perform data entry and understand computer operation.

SCANS SURVEY RESULTS

FOR ELECTRICIAN

Foundation Skills and Personal Qualities	0	1	2	Critical Competencies	
	3	4	5		
Basic Skills					
Demonstrates Effective Reading Strategies	3	4	5		Selects and identifies information and follows a set of instructions
Demonstrates Effective Writing Strategies	3	4	5		Accurately records information, prepares documents/messages, and summarizes information
Applies Arithmetic Processes	3	4	5		Performs basic computations, performs/interprets measurements and analyzes numerical data
Applies Mathematics Processes	3	4	5		Summarizes mathematical data and records results
Demonstrates Effective Listening Skills	3	4	5		Responds to verbal/nonverbal communication and interprets and confirms information
Demonstrates Effective Speaking Skills	3	4	5		Presents basic ideas, explains concepts and actively participates in discussion
Thinking Skills					
Applies Creative Thinking/Generates Ideas	3	4	5		Demonstrates creative thinking process while problem solving
Applies Decision Making Strategies	3	4	5		Analyzes situations and information, considers risks, compiles alternative solutions
Recognizes and Solves Problems	3	4	5		Identifies problems, analyzes possible causes and generates solutions
Demonstrates Visualization	3	4	5		Visually analyzes relationship between parts/whole and interprets symbols, charts and pictures
Knows How to Learn	3	4	5		Draws upon experience and prior knowledge, interprets and applies new knowledge and experience
Applies Reasoning Skills	3	4	5		Applies rules/principles to process and uses logic to draw conclusions
Personal Qualities					
Demonstrates Responsibility	3	4	5		Performs assigned tasks, follows policies/procedures, and works with minimal supervision
Demonstrates Belief in Self Worth	3	4	5		Identifies own skills and abilities, defends own beliefs and viewpoints, values own individually
Demonstrates Sociability in Groups	3	4	5		Responds appropriately to others, modifies behavior to environment and shows empathy for others
Demonstrates Self Management	3	4	5		Identifies own strengths and limitations, maintains self-control, responsible for own behavior and applies self-management skills
Demonstrates Integrity/Honesty	3	4	5		Demonstrates honesty and trustworthiness and accepts responsibility for own behavior

Rankings are averaged.

- 0 = Not Important
- 1 = Somewhat Important
- 2 = Moderately Important
- 3 = Important
- 4 = Very Important
- 5 = Critical

48 SKILL STANDARDS FOR ENERGY INDUSTRY

Foundation Skills and Personal Qualities	0	1	2			Critical Competencies
	3	4	5			
Management of Time and Resources						
Manages Time	■	■	■	■		<i>Efficiently manages time, adjusts schedule as required by supervisor and prioritizes daily tasks</i>
Manages Money						<i>Not applicable</i>
Manages Materials/Facilities	■	■	■			<i>Orders and maintains inventory and monitors safe and efficient use of materials</i>
Manages Human Resources	■	■				<i>Assesses individual skills, determines work load and monitors work assignments</i>
Management and Use of Information						
Acquires/Evaluates Information	■	■	■	■		<i>Selects and obtains information relevant to the task</i>
Organizes/Maintains Information	■	■	■	■		<i>Interprets information and applies processes to new information</i>
Interprets/Communicates Information	■	■				<i>Interprets information and selects methods of communication</i>
Uses Computers to Process Information	■	■	■			<i>Uses integrated software, locates and retrieves stored information and interprets data</i>
Interpersonal Skills						
Participates as Team Member	■	■	■			<i>Demonstrates commitment, identifies with the team, obeys team rules, assists team members</i>
Teaches Others	■	■	■			<i>Conducts task-specific training, coaches others and provides constructive feedback</i>
Serves Customers	■	■	■			<i>Recognizes, analyzes and responds to customer needs, obtains additional resources to meet customer needs</i>
Exhibits Leadership	■	■	■			<i>Leads by example and demonstrates commitment to excellence</i>
Negotiates Agreements	■	■				<i>Moderates discussion, demonstrates composure, and interprets complaints/concerns</i>
Works with Diversity	■	■	■			<i>Recognizes differences, respects rights of others, supports correct course of action</i>
Understanding and Management of Systems						
Understands System	■	■	■			<i>Understands the system/hierarchy and follows processes and procedures</i>
Monitors/Corrects System Performance	■	■	■			<i>Adjusts and monitors system operation and troubleshoots system malfunction(s)</i>
Improves/Designs Systems	■	■	■			<i>Identifies needed systematic improvements and suggests system modifications/improvements</i>
Use of Technology						
Selected Appropriate Technology	■	■	■	■		<i>Understands the requirements of the task and technological results and proposes simple technological solutions</i>
Applies Technology to Task	■	■	■	■		<i>Understands technology applications and applies appropriate technologies</i>
Maintains/Troubleshoots Technology	■	■	■	■		<i>Follows specified maintenance, identifies and troubleshoots malfunctions and failures</i>

Rankings are averaged.

- 0 = Not Important*
- 1 = Somewhat Important*
- 2 = Moderately Important*
- 3 = Important*
- 4 = Very Important*
- 5 = Critical*