A Quick Introduction to Quality Assurance

This section includes skill standards for the manufacturing concentration of Quality Assurance. These skill standards were developed by the Manufacturing Skill Standards Council (MSSC), under the auspices of the National Skill Standards Board (NSSB).

For a detailed explanation of each aspect of the standards, see *A Quick Orientation,* one of the guidebooks included with your binder.

Skill Standards: A Brief Explanation

The MSSC developed skill standards for six concentrations – major areas of frontline manufacturing work covering families of related jobs. The standards in this document cover the Quality Assurance concentration. The Quality Assurance concentration is defined as follows:

QUALITY ASSURANCE	
DEFINITION	**SAMPLE JOBS COVERED**
Ensure the manufacturing system meets quality system requirements as defined by business and its customers.	Lab technician, SPC coordinator, and inspector

The skill standards are made up of two major components. They are:

Information *About the Work.* This component describes what workers need to be able to do on the job to perform competently. It includes:

- *Critical Work Functions* – The major responsibilities of work within a concentration.
- *Key Activities* – The major duties or tasks involved in carrying out a critical work function.
- *Performance Indicators* – Indicators of how to determine when someone is performing each key activity competently.

Information *About the Worker.* This aspect of the skill standards describes the knowledge and skills an individual needs to perform the work described by each critical work function, along with its key activities and performance indicators. There are three types of knowledge and skills:

- *Academic Knowledge and Skills* – Academic skills such as mathematics, reading, etc.
- *Employability Knowledge and Skills* – Broadly applicable skills such as working in teams, analyzing and solving problems, etc.
- *Occupational and Technical Knowledge and Skills* – Occupational and technical skills that tend to be specific to an industry or concentration, such as skill in using inspection tools and equipment, knowledge of manufacturing processes, etc.

For the academic and employability knowledge and skills, the MSSC skill standards provide:

Complexity Ratings: These ratings tells us, for a given critical work function, the level of complexity required in a particular academic or employability knowledge and skill. For example, if writing is required in order to perform a given critical work function, the complexity rating would tell us whether someone needs to write telephone messages versus technical manuals. These ratings were developed using the NSSB Academic and Employability Skill Scales. For more information on the scales and complexity ratings, see *A Quick Orientation* and the *Skill Scales Companion Guide*. There are two types of complexity ratings in the skill standards:

Overall Complexity Rating: As the name implies, the overall complexity rating gives us a rough estimate of the overall level of complexity required for a given knowledge and skill. These ratings are provided for frontline workers (represented by the symbol "W") and first-line supervisors (represented by the symbol "S"). The scale is: **L = Low; M = Moderate; and H = High**

In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

Subdimension Complexity Rating: To give users more detailed information, the MSSC skill standards also provide an individual rating for each subdimension in the NSSB Academic and Employability Skill Scale (See the *Skill Scales Companion Guide*). These ratings apply to frontline workers only. Ratings have not been developed for first-line supervisors at this time. The scale is: **L = Low; M = Moderate; and H = High**

In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

Occupational and Technical Knowledge and Skills

Occupational and technical knowledge and skills are unique to a given industry sector or concentration. In manufacturing, they include knowledge and skills in areas such as inspection tools and equipment, production tools and equipment, and manufacturing processes.

The MSSC standards describe the occupational and technical knowledge and skills needed to perform each critical work function. The occupational and technical knowledge and skills are grouped into categories, with specific examples under each category. Please note that the MSSC did not develop complexity ratings for the occupational and technical knowledge and skills. This may be a part of future research.

Tips for Getting Started

Here are step-by-step instructions to help you get started:

1. Find a critical work function that interests you. Read each of its key activities, along with its associated performance indicators. You will find this information in the "About the Work" section on the left-hand page.
2. Open the fold-out pages and examine the "About the Worker" sections that focus on the academic and employability knowledge and skills.
3. Start by looking at the first academic knowledge and skill, which is always math, and find out the overall complexity rating by looking across the table to the right. To understand what this rating means, see the *Skill Scales Companion Guide*.
4. To find out the subdimension ratings for math, look further across the standards, using the *Skill Scales Companion Guide* to understand what each rating means. Repeat process for rest of academic and employability knowledge and skills.
5. Now, look at the occupational and technical knowledge and skills needed for this critical work function. These are located on the back page of the two-page fold-out section.

QA1

Critical Work Function: Ensure materials meet quality specifications.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Inspect materials against quality specifications	Materials required for production are identified correctly. Non-conforming material is rejected. Inspection results are documented. Documentation records clearly indicate inspection and verification results.
Report material quality deviations to production	Quality deviations are reported to the correct parties in a timely fashion. Quality deviations are described accurately. Quality deviations are reported in prescribed format
Release materials that meet specification to production	Release procedure is implemented according to production plan. Materials are properly identified and labeled. All approvals are obtained before release of materials. Release approvals are properly documented. Materials not ready for release are properly stored or redirected for other use.
Maintain supplier relationships to ensure quality of materials	Positive business relationships are maintained with suppliers. Proper level of security and confidentiality is maintained in relationships with suppliers. Delivery of materials is made just in time to meet production needs. Information regarding cost and price is reported to relevant parties. Suppliers are provided with detailed material specifications, procedures and processes to correct deviations.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**L**	**L**	Complexity of mathematics content	Number sense and computation	**L**
				Geometry, measurement, and spatial sense	**L**
				Complexity of data analysis, statistics, and probability	**L**
				Functions and algebraic thinking	**NA**
				Complexity of representation and communication	**L**
			Complexity of problem solving	Mathematical methods	**L**
				Mathematical reasoning	**L**
				Mathematical tools	**M**
Science	**NA**	**L**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**L**
				Elaboration	**M**
			Complexity of writing process	Writing development	**L**
				To inform	**M**
				To persuade	**L**
Listening	**M**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**L**
			Barriers to communication	Limitations on interaction	**L**
				Distractions	**L**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**L**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**M**
				Training time constraints	**L**
			Frequency of technology change	New learning required	**L**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**L**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**L**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**M**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**L**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**L**
Organizing and Planning	**L**	**L**	Complexity of plans	Goal complexity or ambiguity	**L**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**L**
				Lack of feedback	**L**
				Constraints on resource availability	**M**
Using Social Skills	**M**	**M**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**M**
Adaptability	**L**	**L**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**L**
Working in Teams	**L**	**L**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**L**
				Lack of clarity or stability of responsibilities	**L**
Leading Others	**L**	**L**	Work challenges	Challenges to goal attainment	**L**
				Work structuring requirements	**NA**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**NA**	**L**	Consensus process inhibitors	Number and diversity of stakeholders	**NA**
				Ambiguity of goals	**NA**
				Lack of organizational support, incentives, or consensus leadership	**NA**
				High consensus standard	**NA**
			Difficulty of issues requiring consensus	Complexity of issues	**NA**
				Contentiousness of issues	**NA**
				Lack of opportunities for agreement	**NA**
Self and Career Develop-ment	**L**	**L**	Need for learning and development	Self and career development requirements	**L**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**L**
				Application constraints	**M**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality Process	A. Knowledge of pre-qualification testing procedures to determine the acceptability of new material. B. Knowledge of material data system to verify incoming material against specifications. C. Skill in labeling products correctly for shipping. D. Knowledge of regulations applying to labeling of materials. E. Skill in reporting material quality problems to production and ensuring that any problems are corrected. F. Knowledge of material defect terminology to ensure production and customers are aware of what is being conveyed. G. Knowledge of materials and processes to enable tracking of problems that may occur. H. Knowledge of reporting procedures to ensure correct information is obtained. I. Knowledge of procedures for communicating quality deviations so that deviations are reported accurately and effectively. J. Knowledge of procedure for disposing of non-conforming or scrap products. K. Knowledge of how to use product specifications to accept material. L. Knowledge of quality procedures to ensure correct sampling plan has been applied.	M. Skill in identifying tools and supplies needed to complete task. N. Knowledge of quality procedures to ensure products are checked prior to delivery to customer. O. Knowledge of required approvals in the quality assurance process. P. Knowledge of production process flow and inspection requirements and analysis procedures to measure product quality accurately. Q. Knowledge of what documentation is required to ensure materials are inspected and analyzed appropriately. R. Skill in recognizing non-conformance in a sample to decide whether to reject material. S. Skill in using specifications and instructions to determine proper testing for parts and material. T. Knowledge of the steps in certifying vendors. U. Knowledge of product tolerances and product specifications to meet customer requirements. V. Knowledge of quality plan and procedures and required actions. W. Knowledge of procedures to ensure traceability of nonconforming materials
Manufacturing Process	A. Knowledge of product and specifications. B. Knowledge of manufacturing process in order to identify defects. C. Knowledge of how raw materials are used in the manufacturing process in order to identify root cause of non-conforming product. D. Knowledge of production control systems to release product in timely fashion. E. Knowledge of what information is confidential and proprietary to maintain security.	F. Knowledge of Just In Time (JIT) production practices. G. Knowledge of material product codes (i.e., date manufacturing, lot number and supplier). H. Knowledge of company disposition codes and their use. I. Knowledge of storage areas, accountability, regulations, and tagging procedures for rejected materials.
Suppliers and Vendors	A. Skill in accessing and interpreting the bill of materials for the product being manufactured so the correct supplies are delivered. B. Knowledge of supplier rating systems in order to assess supplier's performance. C. Skill in identifying material problems and monitoring to ensure that they have a minimal impact on the quality of production.	D Skill in analyzing inspection and analysis data from supplier. E. Knowledge of delivery schedules in order to determine whether supplier deliveries are on time and provide feedback to supplier and the purchasing department. F. Knowledge of supplier number system and part revision or material modification system and their use in quality control.
Business Policies and Procedures	A. Skill in calculating and reporting cost versus price for vendor product. B. Knowledge of company policy regarding suppliers. C. Knowledge of customer requirements to ensure positive business relationship.	D. Knowledge of company release policy on parts or materials. E. Knowledge of sampling rates for various suppliers. F. Knowledge of chain of custody, procedures, documentation and responsibility.
Quality Tools and Equipment	A. Knowledge of correct instrument and set up procedures to measure parts and materials correctly. B. Skill in using inspection procedures and equipment (e.g., gauges) to measure quality specifications.	C. Skill in using and interpreting special labels, stamps or identification on parts and materials. D. Skill in using measuring devices (i.e. micrometers, calipers) or procedures to verify that products meet customer specifications.
Statistical Tools and Systems	A. Knowledge of Statistical Process Control (SPC). B. Skill in reading and interpreting a trend chart.	C. Knowledge of sampling procedures for each material to determine whether to accept or reject materials. D. Skill in interpreting SPC data and control charts.
Rejection Procedures	A. Knowledge of rejection procedures for products that don't meet standard. B. Knowledge of other uses for materials to minimize inventory. C. Knowledge of required documentation for non-conforming material. D. Knowledge of each stage of production and quality requirements at each stage.	E. Knowledge of the procedures for storage of parts and materials to prevent damage or degradation. F. Knowledge of release and hold procedures for different levels of deviation to choose correct path of action. G. Knowledge of company codes to identify disposition, type of defects, and causes.

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.

Skill Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality Documentation	A. Knowledge of regulations, identification, and labeling requirements to meet customer expectations. B. Knowledge of the format for reporting quality characteristics to record data correctly. C. Skill in using computer systems to ensure that all appropriate documentation and/or tracking systems have been updated prior to releasing material to production.	D. Knowledge of data entry for database systems. E. Skill in using computing system to drawings and specifications. F. Skill in developing material discrepancy reports that include all the substitutions made for certain materials.
Technical Drawings and Interpretation	A. Knowledge of drawings to ensure product meets engineering requirements. B. Skill in interpreting drawings (i.e., converting left hand to right hand views and understanding flag notes and symbols) and process diagrams.	C. Knowledge of geometric dimensioning and tolerancing.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Ensure materials meet quality specifications		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	4.30	Use email to communicate to suppliers regarding raw materials
		Use PC to enter non-conforming reports
		Use embedded computer systems to look up specifications for materials
		Use computer to record material conditions in order to track quality from particular supplier or job
Gathering and Analyzing Information	4.22	Gather information from PC to check whether supplier corrective action was implemented and sufficient
		Gather information from non-conforming database for disposition of product
		Review and interpret material specifications to facilitate identification of bad materials
		Analyze customer specifications to ensure quality
		Inspect, analyze and label material-report results
Analyzing and Solving Problems	3.96	Identify non-conforming criteria in order to request corrective action needed from supplier
		Solve problems relating to faulty raw materials in order to meet customer requirements
		Analyze problems with products and solve problems by correcting the reason the materials were damaged (e.g., improper storage)
		Analyze recurring problems with materials to suggest process improvements
Making Decisions and Judgments	4.26	Decide if a part is acceptable to use in process
		Determine the usability of raw material in order to decide on disposition of bad quality material
		Determine if parts meet customer specifications
		Determine if alternative materials may be substituted in process if primary material is not available
Organizing and Planning	3.32	Plan on how and what needs to be inspected in order to meet print
		Organize a receiving inspection process to ensure that needed documentation and tools are available for incoming materials
		Organize inspection process to ensure that all materials are available
		Organize inspection activities so that they do not interfere with production schedule
Using Social Skills	3.64	Interact with engineers in a technical way to determine the exact cause and criteria of a defect
		Interact with a supplier in a professional way in order to resolve a defect
		Contact machine operator in a courteous way to arrange for adjustment of the machine that is producing non-conforming parts
		Tell an external or internal supplier about a defect without placing blame

Quality Assurance
Academic and Employability Skill Examples

Adaptability	3.45	Change inspection location to meet the need of the assembly department for faster delivery of purchased products
		Demonstrate openness to accept new methods of inspection of parts
		Demonstrate receptivity to new ideas from suppliers in order to resolve defects
		Demonstrate openness in accepting material substitution in order to meet production needs
Working in Teams	3.59	Team with purchasing to accomplish a better interface with supplier
		Work collaboratively with production in order to have all materials properly identified and labeled
		Work with production to ensure that material inspections don't interfere with production schedule
		Work collaboratively with vendors to improve services and raw materials
Leading Others	3.32	Lead operators to accurately follow production procedures
		Lead quality team to comply with process and customer specifications
		Influence new inspectors to develop a comprehensive understanding of all inspection methods
		Motivate operators to report defects
Building Consensus	2.65	Create agreement between QA and engineering in order to check product against print
		Resolve a line rejection to accomplish a correct product being built
		Facilitate agreement on the best way to handle material defects
		Resolve supplier issues by showing vendors the effect of non-conforming materials on production process and productivity
Self and Career Development	3.24	Attend training on coordinate measure machine to improve inspection techniques
		Attend training on quality standards for receiving inspections to help improve supplier relationships
		Attain training on latest quality specifications to improve inspection accuracy
		Attend training on ISO 9000 to improve quality
Speaking	3.57	Present non con-formances to engineers in order to be clear on the methodology used for the rejection
		Provide feedback on material quality to supervisor
		Tell operator why material does not meet specifications
		Discuss specifications of materials with customers
		Communicate with production regarding the specifications of the product
Listening	3.45	Receive feedback from supervisor in an appropriate way in order to convey accurate specifications
		Listen to concerns of suppliers regarding their problems in order to maintain positive business relations
		Listen to production workers regarding their concerns about a manufacturing process being out of control
		Listen to supplier's explanations regarding material substitutions to determine if the substitution is appropriate

Quality Assurance
Academic and Employability Skill Examples

		Listen to customer's requirements on material specifications
Writing	3.20	Write a report to document supplier quality problems
		Describe discrepant conditions clearly and concisely to facilitate corrective action
		Document non-conformance examples
		Develop written documentation to communicate specifications to co-workers and vendors
		Fill out documentation to clearly indicate inspection and verification results
Reading	4.65	Read the product discrepancy report to determine if extra testing is needed
		Read work instructions to make sure they are understood prior to performing task
		Read latest quality specifications book in order to assure proper documentation
		Read specific standards in order to establish a base line criteria benchmark
Math	4.00	Measure production part for proper specification to blueprint
		Measure non conformances using fractions and decimals
		Calculate the percentage change in scrap
		Use addition and subtraction to determine deviations from specifications
		Calculate the level of non-conforming materials within each shift production
Science	2.65	Conduct metallurgical analysis to ensure quality of materials
		Understand basic chemical concepts to comprehend the quality of chemical materials
		Conduct chemical analysis to verify the purity of chemical supplies

QA2

Critical Work Function: Monitor production operations for product and process quality.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Track materials for quality throughout production process	Detailed quality instructions are prepared for each operation. Accurate information about material quality results is recorded at each operation. Quality information is communicated to all appropriate parties. Accurate records of material movement necessary to ensure quality and traceability are maintained.
Check product sample for quality at each state of production	Sample results are accurately monitored to ensure they comply with specifications. Samples that do not conform to specifications are reported promptly. Records are kept of quality results as required by procedures or work instructions. Samples that do not conform to standards are clearly labeled and documented. Samples that have been checked are indicated at each stage.
Check that final product meets quality specifications	Accurate records of inspections and tests are readily available. Approval and rejection results are communicated on a timely basis to appropriate parties. All product specifications have been followed. Product audits are performed according to defined plan. Follow-up data is reviewed to ensure the customer is satisfied with finished product. Final documentation is obtained from all departments to effectively check product against specifications.
Document quality results at each stage of production process	Proper records are correctly filled out for each stage of production. Approval and rejections are in place as required on appropriate documentation. Quality data meets specification. Final quality results are communicated to appropriate parties. Documentation is clear and complete.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**L**	**L**	Complexity of mathematics content	Number sense and computation	**M**
				Geometry, measurement, and spatial sense	**L**
				Complexity of data analysis, statistics, and probability	**M**
				Functions and algebraic thinking	**NA**
				Complexity of representation and communication	**M**
			Complexity of problem solving	Mathematical methods	**L**
				Mathematical reasoning	**L**
				Mathematical tools	**M**
Science	**NA**	**L**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**L**
				To inform	**M**
				To persuade	**L**
Listening	**L**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**L**
			Barriers to communication	Limitations on interaction	**L**
				Distractions	**M**
Speaking	**L**	**L**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**L**
				Communication indirectness	**L**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**L**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**M**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**L**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**L**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**M**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**M**
Organizing and Planning	**L**	**M**	Complexity of plans	Goal complexity or ambiguity	**L**
				Flexibility required	**M**
				Resource coordination required	**L**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**L**
				Lack of feedback	**L**
				Constraints on resource availability	**L**
Using Social Skills	**L**	**L**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**L**
Adaptability	**L**	**L**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**L**
Working in Teams	**L**	**L**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**L**
				Lack of clarity or stability of responsibilities	**L**
Leading Others	**L**	**L**	Work challenges	Challenges to goal attainment	**L**
				Work structuring requirements	**M**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**NA**	**L**	Consensus process inhibitors	Number and diversity of stakeholders	**NA**
				Ambiguity of goals	**NA**
				Lack of organizational support, incentives, or consensus leadership	**NA**
				High consensus standard	**NA**
			Difficulty of issues requiring consensus	Complexity of issues	**NA**
				Contentiousness of issues	**NA**
				Lack of opportunities for agreement	**NA**
Self and Career Develop-ment	**L**	**L**	Need for learning and development	Self and career development requirements	**M**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**M**
				Application constraints	**L**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality Process	A. Knowledge of notification procedures for approvals and rejections. B. Knowledge of conformance standards for each production stage. C. Knowledge of how to access quality plans and procedures. D. Knowledge of process used to take corrective actions when nonconforming parts are made. E. Skill in applying specifications to ensure quality of product during production process. F. Knowledge of quality acceptance/ stamp process (i.e., ISO 9001, 4.8 & 4.12). G. Skill in conducting audits according to defined plan.	H. Knowledge of procedure for recording sample checks to fulfill requirements. I. Knowledge of procedure for reporting final inspection and analysis results. J. Knowledge of procedures for labeling, storing samples and maintaining chain of custody. K. Knowledge of company quality system, standards and procedures. L. Skill writing Standard Operating Procedures (SOPs) and checklists. M. Knowledge of product audits. N. Knowledge of general measurement system guidelines to determine what, when and where to measure.
Manufacturing Process	A. Knowledge of process flow (e.g., order of manufacturing events) to know where the material is used and ensure quality. B. Knowledge of work instructions for each process to ensure product acceptance. C. Knowledge of the process parameter specifications (e.g., feed and speed) to maintain process capability.	E. Knowledge of manufacturing plans and processes to determine if all manufacturing operations have been completed. F. Knowledge of lot sizes and identification in relationship to quality systems. G. Knowledge of manufacturing planning, processes, and scheduling.
Customer Awareness	A. Knowledge of what records must be maintained. B. Knowledge of customer requirements. C. Knowledge of impact of poor quality material on final product. D. Knowledge of how to respond to customer complaints and where to document those complaints.	E. Skill in identifying and labeling non-conforming materials. F. Skill in performing customer follow-up activities (i.e., surveys, reviews, warranty tracking). G. Knowledge of the importance of using customer complaints as a measure of quality.
Quality Documentation	A. Skill in using performance, charts and trends to monitor process. B. Skill in using computing equipment to track, monitor, record, audit, and verify that parts, assemblies or processes meet quality requirements and specifications. C. Knowledge of terminology and characteristics specific to quality. D. Knowledge of correct approval procedures to document inspection results. E. Knowledge of the procedural requirements for documenting material movement to track materials in process (e.g., ISO requirements).	F. Knowledge of documentation process and requirements to ensure verifiable evidence of product quality. G. Knowledge of where quality records are stored. H. Knowledge of how to interpret identification codes for products. I. Knowledge of how to prepare reports on quality assurance of final products. J. Skill in documenting measurement data.
Quality Tools Statistical Systems	A. Knowledge of statistics for making accurate decisions about quality data. B. Knowledge of Statistical Process Control (SPC) or specific quality system in place to effectively monitor sampling and statistical methods. C. Knowledge of how to access reports from quality assurance software and interpret data correctly to make judgments about final product quality. D. Skill in calculating statistical data and inputting the data to a control chart. E. Knowledge of how to create charts (e.g., variables and attributes) to record and analyze quality measurements from a production process to identify trends in quality.	F. Knowledge of how to use inspection and analysis tools, equipment and procedures. G. Skill in using quality information and control charts to ensure that processes are maintained. H. Skill in selecting and applying appropriate analysis tools (e.g. root cause failure analysis tools) to ensure that the causes of non-conformity are identified and corrected. I. Knowledge of calibration plan and procedures using current references and standards. J. Knowledge of appropriate sampling location, size and procedures to support accurate and unbiased representation.
Quality Specifications	A. Knowledge of the product specifications and how to access them. B. Skill in using appropriate sampling methodology, which follows the company plan.	C. Skill in using drawings or specifications to monitor parts and material quality and ensure that graphical representation matches physical aspect of part.

Critical Work Function: Monitor production operations for product and process quality		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	4.13	Use PC in order to record production results of SPC process
		Use email to communicate revision changes
		Use computer to document holds and restrictions during production process
		Use computer-generated worksheets to track production process and final acceptance
		Verify and record in-process inspections on computer
Gathering and Analyzing Information	4.26	Gather information from process audits in order to maintain process control
		Analyze SPC results to assure quality at each critical production step
		Gather information from parts to create and review inspection reports
		Tally material data and analyze for quality issues using a Pareto chart
		Gather information from quality records to create a history of production activity
Analyzing and Solving Problems	3.83	Identify quality data in order to propose solutions to problems with products
		Anticipate process trend in order to take corrective action so process does not go out of control
		Troubleshoot rejection results in order to identify possible corrective actions
		Identify trends in process controls in order to assure good parts
Making Decisions and Judgments	4.13	Determine if product is suitable to meet customer expectations
		Determine the capability of process in order to continue with the manufacturing process
		Decide whether to stop production to assure that bad product is not passed on to next production operation
		Decide if a corrective action eliminates a defect during an audit
		Decide if a process can be skipped and done at later times of the day
Organizing and Planning	3.82	Plan the inspection points on the routed process in order to ensure the quality of the process
		Organize how employees monitor operations to ensure consistency in quality
		Plan product audits in order to complete final audit in a timely manner
		Organize a plan for identifying and monitoring defects based on company procedures
Using Social Skills	3.55	Interface with operator in a cooperative way to develop an audit schedule
		Contact customers in a courteous way

		Contact production supervisor in a businesslike manner in order to identify a product defect
		Perform the needed monitoring in a way that shows respect for the sourcing entity, including their time
Adaptability	3.27	Demonstrate awareness of new production processes to accurately monitor production quality
		Be adaptable to having to shut down a production process once a defect has been identified
		Be able to move to different production quality areas and maintain same customer standards
		Adapt to changes in production and modify monitoring production plan
Working in Teams	3.68	Team with production and other departments to perform product audits in a timely manner
		Work collaboratively with corrective action teams in order to achieve a more robust process
		Use team approach to check samples with each team having overlapping knowledge
		Team with other work groups to identify special causes of variation of process
Leading Others	3.41	Influence fellow inspectors to follow inspection procedures
		Lead operators to monitor machine more closely and check work more frequently to eliminate quality problems
		Influence co-workers to report accurate information
Building Consensus	2.76	Create agreement on proper gauging methods in order to achieve consistent measuring
		Resolve quality issues with work cell members in order to expedite production
		Build consensus on what items or process must be inspected
		Build consensus on which testing methods should be used at each production stage
Self and Career Development	3.14	Attend sessions on final product and auditing to improve meeting delivery issues
		Attain training on how to create records of inspections and tests to improve record keeping accuracy
		Attain training on Statistical Process Control
		Take training on magnaflux inspection to ensure discrepant product is identified
Speaking	3.33	Discuss production audit findings with stakeholders in order to correct identified problem areas
		Provide feedback on quality rejections to supervisors
		Provide feedback on any approval or rejections to operators to ensure a fast response on any negative item
		Describe data tracking issue with operators
		Report customer satisfaction levels with team members
Listening	3.40	Listen to concerns of machine set up technician in order to resolve tooling problems affecting quality
		Listen to operators to verify that a process in in control

Quality Assurance
Academic and Employability Skill Examples

		Listen to concerns of inspectors on quality issues in order to ensure appropriate operators or managers are contacted quickly
		Listen to operators' suggestions regarding explanations as to why process is out of control
Writing	3.40	Fill out proper records in order to prove proper documentation traceability
		Write new work instructions
		Create monitoring reports detailing operations and related process quality
		Develop written procedures for monitoring product and process quality
		Create a detailed audit plan for product
Reading	4.60	Review manufacturing routings in order to identify inspections points in process
		Read procedures and work instructions thoroughly in order to understand the proper sequence of tasks
		Read process documentation drawings or schematics to accurately monitor production processes
		Read customer data and production non conformance data to determine corrective action
		Read quality instructions to ensure that the proper inspection techniques are being used
Math	4.05	Measures samples of liquids to ensure compliance to standards
		Apply statistical analysis to monitoring process
		Use decimals and fractions to record test data
Science	2.40	Uses basic chemistry and physics to understand the monitoring data

QA3

Critical Work Function: Correct the product and process to meet quality standards.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Communicate quality problems	Quality problems are reviewed with production operators. Quality problems are communicated promptly to appropriate parties. Quality problems are documented according to established processes. Defect trends are summarized and reported to appropriate parties.
Suggest or perform corrective actions to correct quality problems	Minor quality issues or adjustments are made immediately. Quality issues or adjustments are documented properly. Recommendations for action are clear, concise, and supported by data. Recommendations are made to the appropriate parties in a timely way. Follow-up activities indicate that corrective action was taken. Product quality is documented following corrective action.
Determine appropriate action for sub-standard product	Quality procedures regarding sub-standard products are executed promptly within the defined quality systems. Decisions regarding sub-standards products are documented for future retrieval. Sub-standard product is appropriately processed. Documentation required for customers is distributed to appropriate parties.
Record process outcomes and trends	Records on quality process are maintained to appropriate standards. Outcomes of quality processes are charted according to appropriate methods and standards. Data on quality process performance is accurate. Quality process performance data is analyzed to identify trends. Quality process performance data is reported to appropriate parties in a timely manner.
Identify and report performance and training issues affecting quality	Performance and training issues related to quality are identified in a timely manner. Corrective action is taken for quality issues impacting the health or safety of workers.
Implement closed-loop corrective action	Evidence of corrected action is documented in a timely manner. Change resulting from the corrective action is communicated to appropriate parties in the correct format. Implementation of the corrective action is verified through spot checks. Reports are stored properly for the specified timeframes. Ongoing audits are performed to optimize the outcomes of the corrective steps. Previous documentation on similar process issues is examined to identify possible solutions.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**M**	**M**	Complexity of mathematics content	Number sense and computation	**M**
				Geometry, measurement, and spatial sense	**M**
				Complexity of data analysis, statistics, and probability	**M**
				Functions and algebraic thinking	**M**
				Complexity of representation and communication	**M**
			Complexity of problem solving	Mathematical methods	**M**
				Mathematical reasoning	**M**
				Mathematical tools	**M**
Science	**NA**	**M**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**M**
				To inform	**M**
				To persuade	**M**
Listening	**M**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**M**
			Barriers to communication	Limitations on interaction	**M**
				Distractions	**M**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**L**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**M**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**M**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**H**	**H**	Problem complexity	Problem uniqueness or difficulty	**H**
				Number and range of problems	**H**
			Solution complexity	Number and complexity of possible solutions	**H**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**M**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**M**
Organizing and Planning	**M**	**M**	Complexity of plans	Goal complexity or ambiguity	**M**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**M**
				Lack of feedback	**M**
				Constraints on resource availability	**M**
Using Social Skills	**M**	**M**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**M**
Adaptability	**M**	**M**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**M**
Working in Teams	**M**	**M**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**M**
				Lack of clarity or stability of responsibilities	**M**
Leading Others	**M**	**M**	Work challenges	Challenges to goal attainment	**M**
				Work structuring requirements	**M**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**M**	**M**	Consensus process inhibitors	Number and diversity of stakeholders	**M**
				Ambiguity of goals	**M**
				Lack of organizational support, incentives, or consensus leadership	**M**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**M**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**M**
Self and Career Develop-ment	**M**	**M**	Need for learning and development	Self and career development requirements	**M**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**M**
				Application constraints	**M**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale:* H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality Process	A. Knowledge of quality standards and how they apply to products to make effective decisions about quality problems. B. Knowledge of quality procedures and product specifications to identify nonconformance. C. Knowledge of corrective action methods for dealing with non-conformances to avoid future occurrences. D. Knowledge of rejection procedures so that substandard product is rejected and properly processed. E. Knowledge of what constitutes product defects.	F. Skills in evaluating defect patterns. G. Knowledge of how to store reports to ensure that a comprehensive history of problems for specific parts or material exists. H. Knowledge of procedures for processing nonconforming product. I. Skill in recognizing and reporting unsafe conditions. J. Skill in developing and documenting quality procedures, check lists and methods. K. Skill in identifying inaccuracies in quality data and responding to them. L. Knowledge of quality terminology.
Quality Tools and Statistical Systems	A. Skill in using Total Quality Management (TQM) and other quality tools to identify problems and record quality issues. B. Knowledge of statistics for making accurate decisions about quality data. C. Knowledge of how to accurately troubleshoot and categorize defect types to determine root cause. D. Knowledge of how to create charts (e.g., variables and attributes) to record and analyze quality measurements from a production process to identify root causes and recommendations. E. Skill in determining accuracy and precision when using measuring equipment.	F. Skill in developing performance indicators that can be readily understood by operators. G. Skill in using historical data to perform analysis. H. Skill in using design of experiments to determine problems and corrective action while ensuring repeatability and reproducibility. I. Knowledge of Statistical Process Control (SPC) or specific quality system in place to effectively monitor sampling and statistical methods. J. Knowledge of calibration plan and procedures using current references and standards. K. Knowledge of how to use inspection and analysis tools, equipment and procedures.
Quality Documentation	A. Skill in using computing systems to document and track substandard and scrapped parts, materials, and assemblies as required by quality processes. B. Knowledge of documentation process and requirements to ensure verifiable evidence of product quality. C. Knowledge of quality system protocol for performing an audit. D. Knowledge of the procedure for reviewing quality problems with operators to provide feedback. E. Knowledge of correct approval procedures to document inspection results.	F. Knowledge of procedures for recording product history and maintaining records. G. Skill in compiling data and ensuring that changed processes or procedures have met new requirements. H. Knowledge of the appropriate process for storing records to comply with procedures and standards. I. Knowledge of how to complete proper forms to document problems and corrective action.
Corrective Action	A. Knowledge of health and safety standards to ensure quality problems are addressed correctly without impairing health and safety. B. Knowledge of how to conduct follow-up activities to validate that corrective action has been taken. C. Knowledge of how to access and use previous documentation to help develop solutions. D. Knowledge of company's corrective action procedure to follow up on quality problems and corrections. E. Skill in determining corrective action.	F. Knowledge of preventive methods. G. Knowledge of customer requirements H. Knowledge of when to stop process to prevent production of defective product. I. Skill in developing and applying preventive actions and mistake proofing. J. Skill in identifying trends that require a systemic solution. K. Skill in correctly tagging and segregating non-conforming material. L. Skill in investigating non-conformances (e.g., rejection tags) to determine root cause and recommend corrective action.
Continuous Improvement Process	A. Skill in facilitating a corrective action team to determine what will be required to improve the system and its process.	B. Skill in analyzing technical data and drawings and gaining group consensus to avoid future non-conformance.
Business Policies and Procedures	A. Skill in identifying performance expectations to meet production goals. B. Knowledge of the functions of different departments for recommending company-wide solutions.	C. Knowledge of company procedures. D Skill in communicating clearly to large production groups about aspects of the quality system, including documentation, specification, or design changes.
Training	A. Knowledge of documentation process to track and maintain training records and certifications. B. Knowledge of analytical methods for determining training needs (i.e., focus groups, structured interviews, surveys). C. Knowledge of the teaming concepts and cross training methods.	D. Knowledge of assessment methods to identify performance gaps related to training needs. E. Knowledge of the skill and training requirements of the production team for identifying gaps between current skill levels and what is provided in training program.

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 *(continued)*

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

Skill Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Safety Procedures	A. Knowledge of the hazards in the workplace (i.e., spills, noise, air pollution) to ensure personal and fellow employee health and safety. B. Knowledge of health and safety standards to ensure quality problems are addressed correctly without impairing health and safety.	C. Knowledge of chemicals and the Material Safety Data Sheets (MSDS) used to perform quality checks to ensure safety gear is accessible and present.
Customer Awareness	A. Knowledge of customer quality expectations and other key concerns.	
Manufacturing Process	A. Knowledge of basic production processes required to determine the root causes of quality problems. B. Knowledge of policies and procedures for notifying responsible parties of scheduling changes as a result of quality problems with a given product. C. Knowledge of benchmarking process and how to use "best practices" in meeting quality standards. D. Knowledge of production process so that corrective actions can be suggested.	E. Knowledge of where defective products should be stored in order to isolate those from acceptable products. F. Knowledge of work instructions and work procedures for determining appropriate actions. G. Knowledge of who is responsible for a process in order to ensure the problem is directed to the right person. H. Knowledge of quality history of a particular manufacturing process to identify potential corrective actions.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Correct the product and process to meet quality standards		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	4.13	Use PC to record corrective actions
		Use PC to trend quality performance
		Use email to communicate the corrective actions taken to meet specification limits
		Use fax or email to convey information to necessary parties to ensure that appropriate steps are taken in the corrective action stages
Gathering and Analyzing Information	4.52	Gather information for process in order to determine capability of process
		Use work center books to get accurate information on status of operation
		Gather information from reject reports to submit for analysis and review
		Analyze the summary and trend information to define the issue or problem
Analyzing and Solving Problems	4.35	Troubleshoot machine processors using collected data in order to establish root cause of process deviation
		Identify storage practices and procedures to minimize surface abrasions on materials
		Develop a machine maintenance schedule in order to minimize down time
		Identify defect patterns detected on floor in order to have them corrected by management
Making Decisions and Judgments	4.22	Decide what corrective actions are required in order to maximize resources
		Determine the initial defect and root cause of the problem in order to make adjustments on the process
		Determine if decision follows QS-9000 procedures determined in company procedure book
		Determine if new process provides acceptable quality assurance
		Determine if scrap rates are appropriate for the process
Organizing and Planning	3.59	Prioritize the inspection process based on risks and schedule
		Schedule downtime for machine maintenance and plan training for personnel
		Plan corrective actions to be taken when product does not meet customer expectations
		Organize rejection documents in order to conduct trend analysis
Using Social Skills	4.14	Contact manufacturing leader in a cooperative way in order to communicate process capability
		Contact respective parties in a cooperative way to come up with timely corrective actions
		Contact supervisor in a courteous way in order to report corrective actions
		Meet with operators to discuss quality issues in a non-threatening manner to ensure that message is heard
Adaptability	3.55	Demonstrate receptivity to new ideas for CI team to decrease scrap rate
		Revise corrective action plans based on changing production circumstances or constraints

		Demonstrate open-mindedness to production order to close out a corrective action
Working in Teams	4.05	Team with human resources department to identify training needs that eliminate defects
		Team with SPC coordinator to identify key process characteristics that affect process
		Form cross-functional teams to identify a solution to a quality problem
Leading Others	3.64	Initiate cooperation among work cell members to communicate production problems with one another
		Influence co-workers to complete all documentation
		Inspire operators to help monitor the operations of new hires and temps
		Coach operators in quality techniques to correct defects
Building Consensus	3.24	Resolve criteria for inspection methods to accomplish a definite understanding of a problem
		Facilitate agreement on audit time in order to minimize production interruptions
		Use consensus to determine if processes are positively impacting organizational goals
		Use collected data to build consensus on what corrective actions are needed
Self and Career Development	3.62	Identify learning opportunities in understanding statistical trends to gain knowledge of process
		Attain training in statistics to improve effectiveness of corrective actions
		Update measurement skills to improve quality
		Attend training in problem solving techniques
Speaking	3.86	Discuss quality problems with management in order to establish procedures
		Provide feedback and suggestions when corrective actions fail
		Discuss training issues with team to ensure related quality items are identified
		Discuss changes in process with team members
		Give verbal directions on how to perform a task correctly
Listening	3.95	Receive feedback from customer regarding field failures in order to promote future business
		Listen to concerns of inspectors on potential quality problems in order to ensure appropriate operators are contacted
		Listen to the suggestions of production workers on possible corrective actions
		Listen to operators describe a process concern to determine whether the process needs to be altered to ensure quality product
Writing	3.60	Write a weekly report to highlight quality problems for the crew
		Write recommendations for corrective actions
		Write quality procedures
		Document corrective actions taken

Quality Assurance
Academic and Employability Skill Examples

Reading	4.55	Read performance outputs in order to understand process evaluation
		Read previous audit results in order to adjust audit schedules
		Review previous documentation on corrective action in order to identify possible solutions
		Review any deviations noted on product documentation to assure accurate work results
Math	4.10	Calculate sample size for SPC trend of process
		Calculate the average length of time to assemble a product
		Use geometry to describe production problems
		Compare measurements from control chart data
Science	2.55	Knowledge of physical science to conduct stress force experiments
		Knowledge of chemical properties to determine if finish paint meets hardness specifications

QA4

Critical Work Function: Suggest and/or implement continuous improvement actions.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Analyze data to identify potential problems	Quality tools and techniques are properly applied to determine the source of potential quality problems. Process capability is continuously reassessed. Process and product measurement systems are validated. Process and product measurement systems are adjusted as required. Quality data is reported to appropriate parties in a timely manner.
Monitor process capability	Processes meet manufacturer and other quality specifications. Processes meet company or customer capability requirements. Process meets on-time delivery needs of the customer. Analyzed process capability data is reported according to procedures. Results of capability studies are used to adjust product or process. Results of capability studies are distributed to appropriate parties.
Monitor customer satisfaction	Appropriate data is used to measure customer satisfaction. Surveys and other customer data techniques are implemented in a timely manner. Returned goods reported to appropriate parties for review. Customer documentation includes appropriate vendor certifications. On-time delivery data is appropriately documented. Field failures and product life data are reviewed in a timely manner.
Measure and record product and process outcomes	Product and process outcomes are recorded in proper format and timeframe. Appropriate quality analysis and statistical techniques are used to analyze performance. Outcomes are reported to all appropriate parties.
Participate in making new work procedures	Recommendations for continuous improvement are translated into new work instructions. Work instructions are published in appropriate format. Work instructions are distributed according to standard procedures. New work procedures or instructions are discussed with all stakeholders to ensure support for improvements.
Implement approved recommendations	Recommendations for continuous improvement are clear, concise and based on data trends and patterns. Recommendations are made in a way that draws support for process improvement. All stakeholders understand their role in process improvement changes. Accepted process improvements are documented to translate into revised work processes and procedures.
Check that final product meets customer and business needs	Final test results meet customer requirements. Product is produced within company time and cost parameters. Negative customer feedback on quality issues is minimized.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**M**	**M**	Complexity of mathematics content	Number sense and computation	**M**
				Geometry, measurement, and spatial sense	**M**
				Complexity of data analysis, statistics, and probability	**M**
				Functions and algebraic thinking	**M**
				Complexity of representation and communication	**M**
			Complexity of problem solving	Mathematical methods	**M**
				Mathematical reasoning	**M**
				Mathematical tools	**M**
Science	**NA**	**M**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**M**
				To inform	**M**
				To persuade	**M**
Listening	**M**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**M**
			Barriers to communication	Limitations on interaction	**M**
				Distractions	**M**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**M**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**M**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**H**	**H**	Difficulty of information gathering	Amount of information	**H**
				Number and variety of sources	**H**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**M**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**M**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**M**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**M**
Organizing and Planning	**M**	**M**	Complexity of plans	Goal complexity or ambiguity	**M**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**M**
				Lack of feedback	**M**
				Constraints on resource availability	**M**
Using Social Skills	**M**	**M**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**M**
Adaptability	**M**	**M**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**M**
Working in Teams	**M**	**M**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**M**
				Lack of clarity or stability of responsibilities	**M**
Leading Others	**M**	**M**	Work challenges	Challenges to goal attainment	**M**
				Work structuring requirements	**M**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**M**	**M**	Consensus process inhibitors	Number and diversity of stakeholders	**M**
				Ambiguity of goals	**M**
				Lack of organizational support, incentives, or consensus leadership	**M**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**M**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**M**
Self and Career Develop-ment	**M**	**M**	Need for learning and development	Self and career development requirements	**M**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**M**
				Application constraints	**M**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality Policy and Procedures	A. Knowledge of how to prepare reports on quality assurance of final products. B. Skill in analyzing failures in product development, production and in the field. C. Knowledge of TQM principles and methods. D. Skill in interpreting blueprints to measure part and material quality. E. Skills in using quality assurance tools, procedures, and techniques. F. Skill in designing new quality planning procedures and documents. G. Skill in using computer systems to perform analyses. H. Knowledge of how reporting systems work to communicate with appropriate parties. I. Knowledge of requirements for recording product inspections. J. Knowledge of process procedures to determine if process is being completed properly. K. Skill in interpreting testing and inspection results to improve a final product.	L. Knowledge of process documentation and flow charts to continuously improve work processes and procedures. M. Knowledge of process documentation and flow charts to participate in developing work processes and procedures. N. Knowledge of how to report on process capability to monitor quality. O. Knowledge of all parties involved in producing a specific part. P. Skill in using various kinds of tools (i.e., Statistical Process Control (SPC), process flow charts, Quality Functional Deployment, Failure Mode Effect Analysis (FMEA)). Q. Knowledge of final product criteria so that customer and business needs are met. R. Knowledge of production scheduling systems to measure performance. S. Knowledge of the procedure for communicating new processes and procedures to ensure stakeholder awareness.
Continuous Improvement Procedures	A. Skill in following preventive action request procedure to ensure adherence to requirements. B. Knowledge of how to perform process capability studies to ensure accurate data. C. Skill in verifying results to ensure revised procedures have had their intended effect.	D. Skill in using a checklist to examine parts and/or materials to determine whether they are meeting specifications and whether the process needs to be stopped if they are not. E. Knowledge of work processes and procedures to continuously improve production process. F. Knowledge of how to update procedures to ensure process changes are made. G. Knowledge of how to assess and use internal company forms to recommend new work instructions or processes.
Statistical Tools and Systems	A. Skill in using Total Quality Management (TQM) and other quality tools to identify problems and record quality issues. B. Knowledge of statistics for making accurate decisions about quality data. C. Knowledge of how to accurately troubleshoot and categorize defect types to determine root cause. D. Knowledge of how to create charts (e.g., variables and attributes) to record and analyze quality measurements from a production process to identify root causes and recommendations. E. Skill in determining accuracy and precision when using measuring equipment. F. Skill in developing performance indicators that can be readily understood by operators. G. Skill in using historical data to perform analysis.	H. Skill in using design of experiments to determine problems and corrective action while ensuring repeatability and reproducibility. I. Knowledge of Statistical Process Control (SPC) or specific quality system in place to effectively monitor sampling and statistical methods. J. Knowledge of calibration plan and procedures using current references and standards. K. Skill in developing appropriate metric charts to track process performance over time, including information on how the data is calculated, the data source, control limits and goals to have meaningful, actionable data. L. Skill in using various kinds of tools (e.g., Statistical Process Control (SPC), process flow charts, Quality Functional Deployment, Failure Mode Effect Analysis (FMEA) M. Knowledge of how to use inspection and analysis tools, equipment and procedures
Customer Awareness	A. Knowledge of what records must be maintained. B. Knowledge of customer requirements. C. Knowledge of impact of poor quality material on final product. D. Knowledge of how to respond to customer complaints and where to document those complaints.	E. Skill in identifying and labeling non-conforming materials. F. Skill in performing customer follow-up activities (i.e., surveys, reviews, warranty tracking). G. Knowledge of the importance of using customer complaints as a measure of quality.
Corrective Action	A. Skill in changing work instructions to reflect changes made as a result of corrective action. B. Skill in using design of experiment methods to identify potential solutions. C. Knowledge in interpreting customer satisfaction survey results to uncover quality problems.	D. Knowledge of customer non-conformance reports to understand trends in customer complaints. E. Knowledge of who to communicate with when goods are returned in order to address customer concerns. F. Skill in checking returned parts to verify customer complaints.
Quality Documentation Business	A. Skill in documenting process capability studies to plan corrective actions. B. Knowledge of documentation and data change requests to improve procedures and work flow. C. Knowledge of how to recognize data trends that require adjustments to processes.	D. Knowledge of the importance of documenting corrective action recommendations. E. Knowledge of how to record product and process outcomes properly and in a timely manner. F. Knowledge of proper format for writing new work procedures to ensure that procedures are catalogued consistently.

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.

Skill Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Policies and Procedures	A. Knowledge of company strategy and planning regarding market segment, product area, target audiences, distribution channels, and brand image to help develop new procedures. B. Skill in identifying tasks and milestones to develop a logical sequence for implementing process changes. C. Knowledge of cost per piece and product schedule. D. Knowledge of the company needs and objectives to recommend continuous improvements.	E. Knowledge of the role and responsibilities of all stakeholders involved in implementing quality assurance improvements to effectively "roll out" new quality assurance work instructions. F. Knowledge of general business terminology (i.e., gross profits, net profits) to understand the cost of achieving different levels of quality. G. Skill in developing a project implementation timeline to stay focused on goals.
Calibration	A. Skill in statistical measurement systems to verify accuracy of process and product data that is reported. B. Knowledge of how to identify the measurement tool that will produce the most accurate and precise data.	C. Knowledge of measurement technology, including how to determine accuracy, precision, and tolerance trade-offs.
Training	A. Knowledge of requirements for certification for specific job functions.	
Manufacturing Process	A. Knowledge of production process, flow capacity and reliability, inventory, and schedules to modify and improve procedures. B. Knowledge of manufacturing and engineering resources planning systems to ensure completion and delivery of product on time and up to the quality standard expected. C. Knowledge of performance improvement tools and techniques and their application in the development of work procedures.	D. Skill in balancing cost, schedule, and quality trade-offs in order to satisfy customers at a minimal cost. E. Knowledge of improvement process (i.e., identification, definition, analysis, organizing and implementing solutions, and measuring results). F. Knowledge of customer requirements, such as lead-time and delivery schedule. G. Knowledge of the production process and Standard Operating Procedures (SOPs) to assess current situation and recommend new work procedures.
Customer Awareness	A. Knowledge of tools used to measure customer needs (i.e., customer surveys, a 360 degree survey, questionnaires) to improve service based on findings. B. Knowledge of how to access relevant customer satisfaction and complaint data to use this the information to inform quality assurance efforts.	C. Knowledge of the link between customer complaints and quality assurance procedures to perform root cause analysis and solve issues raised by customer complaints. D. Knowledge of company objectives and customer expectations of the product to design procedure that will deliver the expected results.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Suggest and/or implement continuous improvement actions		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	4.13	Use PC to maintain quality standards
		Use planning software to develop new or revised planning
		Use email or websites to post information to customers and workers
		Use statistical software to evaluate impact of contributing variables
Gathering and Analyzing Information	4.13	Gather information from meetings in order to determine continuous improvement activities
		Use data gathered at work centers to improve individual processes
		Use TQM tools, charts, etc. to collect and analyze data
		Analyze data from previous production runs
		Review correct action log and analyze whether the corrective actions were implemented
Analyzing and Solving Problems	4.36	Use fishbone diagram to define and identify quality problems
		Identify productivity of operators in order to determine their performance and opportunities for improvement
		Identify preventive actions that may be taken to demonstrate continuous improvement as required by QS-9000 system
		Identify negative customer feedback in order to avoid repeating the same mistakes
Making Decisions and Judgments	4.22	Determine the procedures needed for process improvements in order to meet the production standards
		Judge if product visual defect warrants product not being shipped
		Decide to change SOP when current practice is leading to injuries
		Determine if continuous improvement activity meets preventive action program requirements set forth by QS-9000
		Determine best method to document work instruction to ensure quality
Organizing and Planning	3.95	Plan the SPC implementation on a machine in order to monitor the capability
		Organize inspection data to show internal customers
		Plan product audits in order to satisfy customer requirements
		Organize implementation of continuous improvement actions for accurate results
Using Social Skills	4.00	Contact other departments in a friendly way in order to get feedback on analyzing suggestions
		Suggest how to improve a production process to supervisor in non-threatening ways
		Strengthen working relations with team members by implementing their useful suggestions and engaging them in the improvement process

Quality Assurance
Academic and Employability Skill Examples

		Improve morale by seeking a broad range of input and respecting the effect on other stakeholders in the process
Adaptability	3.45	Change work methods to meet the needs of all others who must follow procedures
		Alter improvement plans based on introduction of new information
		Change the inspection methods to meet the needs of the machine operator
		Adapt improvement plan that is not producing the predicted results
Working in Teams	4.18	Team with corrective action teams to monitor downstream process to accomplish feedback on quality of products
		Work collaboratively with production to determine sources of potential quality problems
		Work with supervisors and other cell group members to write new work procedures
		Work with operations supervision and maintenance to correct process caused by equipment
Leading Others	3.59	Lead co-workers in collecting SPC data and interpreting the meaning of the data and charts
		Influence others to take a proactive approach to implementing continuous improvements
		Lead operators to foolproof new assembly methods
		Influence workers in translating continuous improvements into new work orders
Building Consensus	3.38	Facilitate agreement on needed information to reply to customer specs in a more timely manner
		Facilitate agreement on "customer filed issue" in order to minimize product reputation
		Build agreements by scheduling meetings that will be attended by all stakeholders
		Facilitate agreements on planning in order to set standards throughout the shop
Self and Career Development	3.71	Obtain certifications in ASQ
		Attend training on TQM
		Attend training on six sigma in order to improve customer satisfaction
Speaking	4.14	Talk with purchasing department regarding trends of specific supplier in order to maintain an accurate supplier rating
		Talk with supervisors about data in the SPC chart in order to keep process in control
		Provide feedback to work crew on corrective action taken to reduce testing
		Discuss new work procedures with team to ensure proper implementation
		Report on returned goods immediately to appropriate parties to ensure quick rework of product
Listening	4.15	Listen to quality engineers to determine feedback of problem suppliers and manufacturing processes

Quality Assurance
Academic and Employability Skill Examples

		Listen to concerns of customers in order to address these concerns
		Receive feedback from operators on how a certain work activity could be redone to increase quality and productivity
		Listen to concerns of work team in order to suggest new work procedures
Writing	3.35	Write work instructions for quality manual following QS-9000 format
		Write forms for customer documentation
		Fill out a proposal for process improvement suggestions
		Analyze data in written form in order to forward to management
		Document performance measures of the quality process
Reading	4.55	Read analyzed data in order to identify problems
		Read machine gauges to ensure process is under control
		Read current process requirements in order to develop revised processes
		Read recommendations submitted for continuous improvement by work teams in order to determine opportunities for improvements
		Read production reports
Math	3.95	Calculate the measurements for out of control conditions
		Calculate statistics in quality tools and techniques
		Estimate customer satisfaction by interpreting statistical survey results
		Estimate potential gains in process improvements
		Track production using common formulas and percents
Science	2.55	Knowledge of chemical properties in order to suggest improvements to chemical processing
		Knowledge of physical science to suggest alternatives to metal processing
		Knowledge of metals to recommend substitutions of certain components in the operations

QA5

Critical Work Function: Coordinate work team to facilitate quality assurance.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Provide training to other employees	Cross-training is provided as appropriate. Employees in need of training are correctly identified. Training needs are assessed regularly. New training requirements are anticipated. Training approaches effectively achieve training goals. Training outcomes are documented.
Participate in meetings and problem-solving groups	Meeting notes including decisions made are documented appropriately. Meeting notes are distributed to relevant parties. Proper problem-solving processes are used during meetings and other group activities.
Coordinate work flow with team members and other work groups	Production schedules are effectively met. Team members are notified of schedule requirements in an appropriate timeframe. Production workflow runs efficiently and smoothly. Downtime is minimized. Positive relationships are maintained with others to facilitate effective workflow.
Promote career development	Appropriate techniques are used to solicit input. Learning opportunities are selected to address the individual needs of team members. Team interactions positively reflect individual and team learning. All team issues are dealt with using appropriate confidentiality and flexibility.
Maintain personal certification and licensure	Certifications are performed by the appropriate parties. Certifications are updated as appropriate. New requirements are communicated appropriately. Documentation is available to appropriate personnel. All necessary training is obtained to meet requirements.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**NA**	**L**	Complexity of mathematics content	Number sense and computation	**NA**
				Geometry, measurement, and spatial sense	**NA**
				Complexity of data analysis, statistics, and probability	**NA**
				Functions and algebraic thinking	**NA**
				Complexity of representation and communication	**NA**
			Complexity of problem solving	Mathematical methods	**NA**
				Mathematical reasoning	**NA**
				Mathematical tools	**NA**
Science	**NA**	**L**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**L**
				To inform	**M**
				To persuade	**M**
Listening	**M**	**H**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**M**
			Barriers to communication	Limitations on interaction	**L**
				Distractions	**M**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**M**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**L**	**L**	Complexity of technology application	Complexity of equipment or technology	**L**
				Complexity of applications	**L**
				Training time constraints	**L**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**M**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**M**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**M**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**M**
Organizing and Planning	**M**	**M**	Complexity of plans	Goal complexity or ambiguity	**M**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**M**
				Lack of feedback	**M**
				Constraints on resource availability	**M**
Using Social Skills	**H**	**H**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**H**
Adaptability	**M**	**M**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**M**
Working in Teams	**H**	**H**	Degree of collaboration required	Task interdependence	**H**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**M**
				Lack of clarity or stability of responsibilities	**M**
Leading Others	**M**	**H**	Work challenges	Challenges to goal attainment	**M**
				Work structuring requirements	**M**
				Scope and complexity of leadership responsibility	**M**
			People challenges	Coaching or monitoring needs	**M**
				Conflict management needs	**M**
Building Consensus	**M**	**H**	Consensus process inhibitors	Number and diversity of stakeholders	**M**
				Ambiguity of goals	**M**
				Lack of organizational support, incentives, or consensus leadership	**M**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**M**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**M**
Self and Career Develop-ment	**M**	**M**	Need for learning and development	Self and career development requirements	**M**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**M**
				Application constraints	**M**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Training	A. Knowledge of technical data and terminology in order to instruct production workers. B. Knowledge of goal setting and planning tools to enable personal career development planning. C. Skill in using a pay-for-knowledge system. D. Skill in orienting newly transferred employees or new hires. E. Knowledge of all inspection equipment in order to train others. F. Skill in documenting current work procedures so that coworkers can be cross-trained. G. Skill in motivating others to actively participate in training sessions to increase knowledge of process. H. Knowledge of brainstorming techniques to identify problems and make project plans. I. Skill in developing a training requirements matrix to ensure employees receive the necessary training. J. Knowledge of how to use tools for assessing training needs to ensure the best use of training resources.	K. Skill in continuously assessing training to ensure employees are receiving quality training. L. Knowledge of different types of specifications in order to explain their content to others. M. Skill in interpreting blueprints in order to teach others how to interpret their meaning. N. Skill in developing a professional development plan outlining technical training required for a production team. O. Knowledge of how to train new employees. P. Knowledge of which employees require certification. Q. Skill in developing mission and vision statement. R. Skill in assessing the effectiveness of quality assurance training to decide what training programs should be retained. S. Knowledge of technical skills needed for various job categories, so that appropriate training programs can be selected for employees. T. Knowledge of all jobs in work area to make work assignments effectively and determine potential for promotions.
Business Policies and Procedures	A. Skill in setting short and long-term goals for the organization and self. B. Skill in tracking quality data related to product liability issues. C. Knowledge of liability costs and consequences related to poor quality. D. Skill in dealing with continuous change and improving performance to help the company thrive.	E. Knowledge of the agendas of other organizations to help those organizations achieve their goals. F. Skill in involving managers in defining key job roles.
Planning and Scheduling	A. Knowledge of production control plans to ensure smooth production workflow. B. Skills in developing schedules. C. Knowledge of how to re-route work to minimize downtime and handle unforeseen changes, such as part shortages. D. Knowledge of production schedule in order to keep work flow running smoothly.	E. Skill in calibrating measurement tools to complete the required tags and paperwork. F. Knowledge of calibration and certification requirements, including data tracking requirements. G. Skill in using a Gantt chart to coordinate and plan production scheduling so that inspection can be done effectively.
Statistical Tools and Systems	A. Skill in interpreting charts to analyze quality trends. B. Skill in creating a process flow diagram to understand the efficiencies of the flow cycle. C. Skill in using a tally sheet to collect data so that training requirements can be identified.	D. Skill in working through a five-point cause and corrective action program to solve quality issues. E. Knowledge of the tools and techniques of problem solving to achieve the team's objectives (i.e. group dynamics, brainstorming, objective matrix, and force field analysis.) F. Knowledge of push/pull, Kanban, and other lean manufacturing concepts.
Meeting Techniques	A. Skills in documenting key points made at meeting for future reference. B. Skill in knowing how to ensure issues and concerns raised at a meeting are followed up. C. Skills in meeting facilitation.	D. Knowledge of how to use listening skills to learn and participate in meetings and problem solving sessions. E. Skill in issue identification. F. Knowledge of ISO standards for meeting minute documentation and filing.
Certification and Licensure	A. Knowledge of how to obtain needed training for re-certification. B Knowledge of types of quality assurance certifications so that appropriate actions are taken to obtain certification. C. Knowledge of certification licensure opportunities for various job titles so that employees can be advised. D. Knowledge of what skills are required by different types of work to get certified.	E. Skill in maintaining personal certification and licensure to keep abreast of new developments. F. Knowledge of re-certification criteria so that personal certification and licensure may be retained. G. Knowledge of company's certification requirements for individual jobs to keep workforce up-to-date and current on latest technology.
Manufacturing Process	A. Knowledge of manufacturing process to adequately train people on the role of quality in production. B. Knowledge of manufacturing plans and schedules to run workflow efficiently and smoothly.	C. Knowledge of the importance of quality assurance within the overall organization to align skills with company needs. D. Knowledge of personnel and departments that affect the quality of production to ensure all necessary parties are included in and are aware of the decision-making process.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Career Opportunities	A. Knowledge of career opportunities and required training for team members. B. Knowledge of company policies and future plans to ensure employees are working toward those goals. C. Knowledge of the common skill requirements among different jobs and job functions.	D. Knowledge of techniques, such as surveys, research and mentoring, to solicit input on career development. E. Knowledge of various quality organizations and professional societies to learn more about quality.
Customer Awareness	A. Knowledge of the data related to customer expectations and goals to improve quality.	B. Knowledge of quality system capabilities to make sure customer is aware of the benefits.
Quality Processes	A. Knowledge of experimental design methods to improve production quality. B. Knowledge of technical testing (e.g., chromatography and oxidation).	C. Skill in training people in technical testing.

Critical Work Function: Coordinate work team to facilitate quality assurance		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	3.35	Use intra-net to announce meeting schedules
		Use overhead projectors and LCD panels to present training materials
		Track process teams on Excel spreadsheets
		Create team presentations on PowerPoint
		Use Excel to maintain certification matrix
Gathering and Analyzing Information	3.67	Gather information from skills assessments to determine training needs
		Gather information from team meetings to develop training standards
		Analyze information from inspections to prioritize assignments
		Compile data gathered in problem solving groups to aid in coordination activities
		Analyze certification records to determine if employees are properly trained for their work assignments
Analyzing and Solving Problems	3.91	Identify team activities in order to get the best people to analyze the problem and institute corrective actions
		Identify operators that make the most computer errors to retrain on SAP procedures
		Identify possible problem solving processes in order to help with team solving approaches
		Conduct team meetings to identify root causes of process problems and develop solutions
Making Decisions and Judgments	3.91	Determine who should be provided training to improve quality outcomes
		Determine best method for identifying non conformance in products
		Decide to renew auditor certification in order to continue as internal auditor
		Decide which training is most effective in order to ensure customer quality standards
Organizing and Planning	3.33	Plan continuous improvement meetings to occur across shifts
		Prioritize training activities to achieve maximum benefits
		Organize employee certification program to meet customer requirements
		Organize quality data in order to share with team members in a comprehensive manner
Using Social Skills	3.91	Work with team in a cooperative way to assure effective management of process/product quality
		Interact with fellow operators in a mentoring way in order to prevent a defect reoccurrence
		Brainstorm team members' ideas in a positive and friendly way
		Use diversity of workforce as a tool to facilitate quality production
Adaptability	3.52	Change training agenda to meet the needs of the crew

Quality Assurance
Academic and Employability Skill Examples

		Demonstrate willingness to cross train in order to be more efficient and effective
		Alter job schedule to adapt to new change
Working in Teams	3.90	Team with other inspectors to accomplish better methods of inspection and uses of equipment
		Work with supervisor to ensure all employees are informed about new work procedures
		Team with R&D to adjust specification limits that are historically in need of changes
		Establish a multi-team approach to quality by rotating exposure of each team member to each part of the quality process
Leading Others	4.00	Energize others on team to suggest ways to improve QA
		Use mentors and leaders to work with new hires so they will understand business goals and processes
		Influence inspectors to accomplish working with shipping personnel to get parts out on time
		Mentor team members to attain educational pursuits
Building Consensus	3.67	Facilitate agreement on project scope in order to use limited resources effectively
		Facilitate agreement on assembly methods in order to reduce outgoing quality defects
		Resolve conflicts between teams by encouraging the development of mutual goals
		Use "Memorandum of Understanding" between different teams to ensure consensus on major issues
Self and Career Development	3.81	Attend training in meeting facilitation to improve meeting efficiency
		Attend training on team building techniques to improve team productivity
		Identify personal and team training plan
		Attend training on leadership skills
Speaking	4.05	Discuss individual training needs in order to receive the most up-to-date training
		Provide feedback on training program to non-technical trainers
		Talk with work team about improving process capability during team meetings
		Present training and certification opportunities to team members to encourage educational pursuits
		Articulate team goals to management and other work teams
Listening	3.89	Listen at team meetings in order to determine actions that need to be taken
		Listen to concerns of team members regarding needed training
		Receive feedback on the effectiveness of training from those trained, in order to improve the training
		Listen to team members express their role in quality assurance in order to expand the team process
Writing	3.55	Write requirements to certify inspectors
		Fill out team forms to facilitate data collection

		Prepare written summary information on training guidelines
		Document training materials
		Create a detailed career enhancement plan for team members based on current work performance and future goals
		Write minutes from team meetings
Reading	4.11	Read meeting minutes in order to identify action items
		Read work team code of conduct to ensure team adherence to the rules
		Read training manuals in order to learn new job skills
		Read JSAs to ensure team safety on the floor
		Read proposed training materials prior to training session to ensure that the materials contain the most up-to-date information
Math	2.65	Construct Pareto charts for team review of critical issues
		Calculate the impact each group has on the production standard
Science	1.90	Knowledge of basic scientific tests in order to provide or attend training
		Knowledge of the biological impact on workers that some processes have in order to discuss safety precautions during team meetings

QA6

Critical Work Function: Produce product to meet customer needs.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Identify customer needs	The different and common needs of internal and external customers are recognized. Customer contact about product aspects and printed specifications is maintained to ensure understanding of needs. Customer needs are reviewed on a regular basis. Customer specifications are up-to-date. Customer needs are communicated effectively to others including shift-to-shift, co-workers, and managers. Issues preventing customer needs from being met are addressed proactively.
Determine that resources such as materials, tools and equipment, are available for the production process	Raw materials are checked against work order. Tools and equipment are checked against work order. Inventory discrepancies are communicated to the proper parties. Necessary resources are at workstation when required. Workers with appropriate skills are scheduled according to production needs.
Set up equipment for the production process	Proper repairs and adjustments are made to production equipment prior to putting into service. Set-up meets process specifications of internal and external customers. First piece of production run meets specifications. Set-up procedures are documented for repeatability. Set-up meets ergonomic and other relevant health, safety, and environmental standards. Set-up meets equipment specifications.
Perform the process to make the product	Process control data indicates that the manufacturing process is in compliance with standards. Manufacturing process cycle time meets customer and business needs. Operations are performed safely. Product meets customer specifications. Product and process documentation is completed, maintained and forwarded to the proper parties. Production operations comply with all health, safety, and environmental policies and procedures.
Inspect the product to make sure it meets specifications	The calibration of the testing equipment is verified. Established sampling plan and inspection policies and procedures are followed. Product and production processes that do not meet specifications are identified promptly. Inspection documentation is completed accurately and forwarded to the correct parties. Appropriate testing and inspection tools and procedures are followed. Adjustments needed to bring the production process back into specification are identified and communicated. Necessary adjustments are performed in a timely manner.
Document product and process compliance with customer requirements	Documentation of compliance is legible. Documentation of compliance is written in the appropriate format and correctly stored. Documentation of compliance is forwarded to the proper parties. Documentation is complete and "sign off" is obtained. Products are labeled appropriately for compliance or non-compliance.
Prepare final product for shipping or distribution	Packaging materials meet packaging and shipping specifications, including proper labeling. Completed documentation of packaging and customer shipping instructions accompany the product to the next destination. Product availability is communicated to the proper parties in a timely manner. The product and all relevant information such as quantity, destination, and packaging instructions, are checked against the work order. Product is correctly stored or staged for shipping. All laws and regulations with regard to labeling, packaging, and transport are followed. Material handling procedures are followed to prevent product damage.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**L**	**L**	Complexity of mathematics content	Number sense and computation	**M**
				Geometry, measurement, and spatial sense	**L**
				Complexity of data analysis, statistics, and probability	**L**
				Functions and algebraic thinking	**NA**
				Complexity of representation and communication	**L**
			Complexity of problem solving	Mathematical methods	**L**
				Mathematical reasoning	**L**
				Mathematical tools	**M**
Science	**NA**	**L**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**L**
Writing	**L**	**M**	Complexity of text	Complexity of text	**L**
			Complexity of writing product	Type of product	**L**
				Organization	**L**
				Elaboration	**L**
			Complexity of writing process	Writing development	**L**
				To inform	**L**
				To persuade	**L**
Listening	**M**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**L**
			Barriers to communication	Limitations on interaction	**M**
				Distractions	**M**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**L**
				Communication indirectness	**L**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**M**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**L**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**L**
				Lack of analysis guidelines	**L**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**M**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**L**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**L**
Organizing and Planning	**M**	**M**	Complexity of plans	Goal complexity or ambiguity	**L**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**L**
				Lack of feedback	**L**
				Constraints on resource availability	**M**
Using Social Skills	**M**	**M**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**L**
				Tact and sensitivity required	**M**
Adaptability	**M**	**M**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**M**
Working in Teams	**M**	**M**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**M**
				Lack of clarity or stability of responsibilities	**M**
Leading Others	**L**	**M**	Work challenges	Challenges to goal attainment	**M**
				Work structuring requirements	**L**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**L**	**M**	Consensus process inhibitors	Number and diversity of stakeholders	**M**
				Ambiguity of goals	**L**
				Lack of organizational support, incentives, or consensus leadership	**L**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**L**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**M**
Self and Career Develop-ment	**M**	**L**	Need for learning and development	Self and career development requirements	**M**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**M**
				Application constraints	**M**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Inspection Tools and Equipment	A. Skill in using inspection equipment, including how to calibrate, what type of equipment to use, and what frequency to use.	B. Skill in using multi-gauging to inspect, verify, and document whether product dimensions meet customer requirements.
Production Tools and Equipment	A. Skill in reading and interpreting gauges (i.e., analog, digital and vernier). B. Knowledge of how to determine whether additional tools need to be purchased. C. Knowledge of lubricants and coolants to make the proper selection.	D. Skill in setting up, programming, and operating the computerized control process. E. Skill in operating production equipment. F. Knowledge of equipment capabilities to maximize productivity.
Reading and Interpreting Drawings	A. Skill in interpreting technical drawings so that customer needs are met.	
Manufacturing Process	A. Skill in communicating work orders and customer needs to production crew to minimize errors and maximize understanding. B. Knowledge of manufacturing process to be used. C. Knowledge of the materials to be used. D. Knowledge of how to order materials and tools. E. Knowledge of how to use and interpret measurement devices. F. Knowledge of procedures used to perform a self-inspection. G. Knowledge of packing and shipping processes to prepare product for shipment. H. Knowledge of available processes to determine if job can be done.	I. Knowledge of machinery operation, set up and testing. J. Skill in setting up and testing machines. K. Knowledge of how to carry out non-compliance procedures. L. Knowledge of statistical methods to determine when process is out of control. M. Skill in troubleshooting process to isolate the cause of problem. N. Knowledge of how to estimate time to determine delivery schedules and cost. O. Knowledge of how to implement quality assurance principles and methods, such as ISO 9000.
Customer Awareness	A. Knowledge of how customers will use a product to confirm the product as built will meet customer needs.	
Work Orders and Documentation	A. Skill in interpreting work orders to meet customer need. B. Skill in making machine adjustments. C. Skill in reviewing order sheets to determine if on-site adjustments are needed. D. Knowledge of how to use diagrams and technical drawings. E. Skill in interpreting route sheets and operation sheets to set-up and operate machine.	F. Skill in completing a compliance tag to indicate that the sub-assembly meets the customer requirements. G. Knowledge of customer shipping instructions to determine packing requirements. H. Knowledge of available packing materials to determine the safest method of shipping the product.
Health and Safety Policies	A. Knowledge of sanitation procedures. B. Knowledge of state and federal regulatory requirements (e.g., Occupational Safety and Health Administration (OSHA). C. Knowledge of safety procedures for chemical spills. D. Knowledge of how to safely move materials.	E. Knowledge of proper use of shipping safety equipment. F. Knowledge of emergency or evacuation procedures. G. Knowledge of Personal Protective Equipment (PPE) requirements, including safety shoes, goggles and helmets.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Produce product to meet customer needs		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	4.19	Use computerized manufacturing system for Bill of Materials specifications and general assembly procedures
		Use computer to input quality data collected
		Obtain customer requirements from ordering tracking system
		Use a material management system in order to ensure all parts and machine capacity is available to all production
		Use PC to document initial set up of production run
Gathering and Analyzing Information	4.19	Gather information on operations and testing of product in order to evaluate conformance to specifications
		Obtain information related to customer needs from email to use as a basis for production and scheduling
		Use quality circles to discuss day-to-day production issues and solutions
		Use inspection equipment to locate quality problems and refine the manufacturing process
		Collect data on parts delivery schedule to ensure parts are there when they are needed
Analyzing and Solving Problems	3.94	Identify and solve potential problems before final production to ensure customer needs are met
		Monitor quality of batch to make sure product meets specs
		Identify possible road blocks in order to reduce or remove blockage to meet customer requirements.
		Anticipate production quantities to prepare for shipping and distribution
		Review production schedule and calculate staffing requirements
Making Decisions and Judgments	4.25	Determine if product meets specifications before releasing to plant operations
		Determine if initial piece meets required specs so that production may be started
		Determine availability of resources
		Decide if vendor materials are of adequate quality to meet expectations
		Determine proper packaging for product to limit product damage during shipment
Organizing and Planning	3.83	Plan production schedule in order to meet customer demand
		Organize shipping schedules to assure product arrives at next destination on time
		Organize paperwork so that production flows smoothly for operators
		Organize the equipment to create a flow line for the product through a complete stage of production
Using Social Skills	3.84	Meet with customers in a professional way to identify customer specific requirements

		Communicate with vendors who supply materials about requirements with regard to delivery times and product specifications
		Give positive feedback to internal customers
		Value everyone's input into a team process
Adaptability	3.94	Change material or part to comply with new customer requirements
		Be receptive to changes of schedules and priorities to meet needs of the customer
		Aid in process or equipment changes to help keep product moving
		Be willing to operate other machines to reduce work load shortages and overloads
Working in Teams	4.13	Coordinate inter-department requirements to ensure final product meets specs
		Work with all team members to coordinate material flow across multiple processes or workstations to assure on time delivery
		Work collaboratively with other operators in order to complete all steps of production process
		Engage in cross-functional teams to establish schedule attainment and set goals for daily production
Leading Others	3.68	Help co-workers understand job requirements
		Lead team meetings to determine customer needs, set up priorities and available resources
		Influence other workers to accomplish production and quality goals
		Influence others to work safely even in the face of hurried production
		Coach and train a new employee
Building Consensus	3.13	Be able to explain to the work team why a customer needs a modification
		Encourage co-workers to share a common goal--customer satisfaction
		Communicate with different levels of management that a process needs to be changed and why
		Resolve issues regarding production and process before implementation
		Resolve conflicts between two team members working together on a line
Self and Career Development	2.97	Acquire new skills and continue education to improve meeting customer needs
		Request training in weak areas to support growth and improve work
		Acquire training on ISO 9000
		Promote and support on-site learning opportunities
Speaking	3.38	Verbally clarify customer needs to co-workers
		Present concerns to supervisor about production schedules and personnel needed to meet that schedule
		Provide feedback on process for quality improvement
		Discuss schedules and establish timelines with customers
		Discuss needed changes in materials with customers

Quality Assurance
Academic and Employability Skill Examples

Listening	4.07	Listen to and understand work instructions
		Listen to customer requirements, complaints and praise and forward the information to appropriate people
		Receive feedback from supervisors
		Listen objectively to the customer's requirements, even though they may exceed existing specs
		Listen to the needs of co-workers regarding production
Writing	3.79	Write memos to communicate problems and changes to fellow team members
		Document inspection results
		Fill out order forms
		Complete SPC chart
		Create written instructions for set-up of production equipment
		Develop written instructions for special material handling
Reading	4.54	Read work instructions and control documents
		Read blueprints to meet customer needs
		Read and understand quality documentation and production spec sheets
		Read instructions required to set up equipment and document process
		Read customer orders
Math	4.34	Add, subtract and divide numbers to adjust inventory report
		Calculate percentages in order to make machine adjustments
		Measure product against specifications for quality assurance (fractions and decimals)
		Understand geometry in order to interpret blueprints
		Calculate the correct amount of products shipped
Science	2.93	Adjust chemical usage and effect on process
		Knowledge of metallurgy in order to ensure that corrosive metals are not combined
		Understand the soldering process and how it works

QA7

Critical Work Function: Maintain a safe and productive work area.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Perform environmental and safety inspections	Potential hazards in the work are identified, reported, monitored. Corrective action is taken to correct potential hazards. Health, safety and environmental documentation and policies are thoroughly and regularly reviewed. Inspections meet all relevant, health, safety, and environmental laws and regulations. Inspections are done according to company schedule and procedures. Inspections are documented. Inspection records are stored correctly.
Perform emergency drills and participate in emergency response teams	Training and certification on relevant emergency and first aid procedures is complete and up to date. Emergency response complies with company and regulatory policies and procedures. Emergency drills and incidents are documented promptly according to company and regulatory procedures.
Identify unsafe conditions and take corrective action	Conditions that present a threat to health, safety and the environment are identified, reported, and documented promptly. Corrective actions are identified. Appropriate parties are consulted about corrective actions. Corrective actions are taken promptly according to company procedures. Ongoing safety concerns are tracked and reported until corrective action is taken.
Provide safety orientation to other employees	Orientation covers all topics and procedures needed to facilitate employee safety. Orientation makes clear the need and processes for employees to raise safety concerns, ask questions, and receive additional training. Orientation is documented according to company requirements. Orientation meets all relevant laws, policies, and regulations. Safety training is delivered regularly.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**NA**	**L**	Complexity of mathematics content	Number sense and computation	**NA**
				Geometry, measurement, and spatial sense	**NA**
				Complexity of data analysis, statistics, and probability	**NA**
				Functions and algebraic thinking	**NA**
				Complexity of representation and communication	**NA**
			Complexity of problem solving	Mathematical methods	**NA**
				Mathematical reasoning	**NA**
				Mathematical tools	**NA**
Science	**L**	**L**	Complexity of scientific inquiry	Design	**L**
				Use of evidence	**L**
			Complexity of understanding the nature of science	Unifying concepts and processes	**L**
			Complexity of core scientific content	Physical science	**M**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**L**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**L**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**L**
				To inform	**M**
				To persuade	**L**
Listening	**M**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**L**
			Barriers to communication	Limitations on interaction	**M**
				Distractions	**M**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**L**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**L**	**L**	Complexity of technology application	Complexity of equipment or technology	**L**
				Complexity of applications	**L**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**M**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**M**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**L**	Degree of judgment or inference required	Lack of guidance or precedents	**M**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**L**
Organizing and Planning	**L**	**M**	Complexity of plans	Goal complexity or ambiguity	**L**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**L**
				Lack of feedback	**M**
				Constraints on resource availability	**M**
Using Social Skills	**M**	**M**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**M**
Adaptability	**L**	**L**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**L**
Working in Teams	**L**	**M**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**L**
				Lack of clarity or stability of responsibilities	**L**
Leading Others	**L**	**M**	Work challenges	Challenges to goal attainment	**M**
				Work structuring requirements	**L**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**L**	**L**	Consensus process inhibitors	Number and diversity of stakeholders	**L**
				Ambiguity of goals	**L**
				Lack of organizational support, incentives, or consensus leadership	**L**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**L**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**M**
Self and Career Develop-ment	**NA**	**L**	Need for learning and development	Self and career development requirements	**NA**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**NA**
				Application constraints	**NA**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Safety Procedures	A. Knowledge of how to locate and use Material Safety Data Sheets (MSDS). B. Knowledge of company first aid or first response procedures. C. Knowledge of material handling techniques to safely move materials. D. Knowledge of how to be proactive in responding to a safety concern and document occurrences. E. Knowledge of emergency exits. F. Knowledge of various emergency alarms and procedures.	G. Knowledge of clean-up procedures for spills. H. Knowledge of Lock Out/Tag Out requirements. I. Knowledge of how to inspect work area and report possible safety risks. J. Knowledge of machine functions to determine if all safeguards are operational. K. Knowledge of safety procedures in case of smoke or chemical inhalation. L. Knowledge of procedures for handling hazardous materials.
Personal Safety	A. Skill in identifying and reporting unsafe conditions. B. Knowledge of safety issues related to hazardous materials. C. Knowledge of housekeeping needed to maintain a safe work environment.	D. Skill in determining if all safety guards are in place prior to machine operation. E. Knowledge of clothing and personal protective equipment (PPE) that should be worn to ensure safety.
Safety Policies and Regulations	A. Knowledge of basic filing procedures to properly store inspection records. B. Knowledge of safety requirements and environmental regulations related to performing inspections. C. Knowledge of policies and procedures needed to perform audits and train employees about hazardous conditions.	D. Knowledge of company safety standards for handling potential hazards. E. Knowledge of how to safely store, identify, and use hazardous materials and pressurized vessels. F. Knowledge of OSHA and other health and safety requirements as applied to the workplace.
Corrective Action	A. Knowledge of what constitutes an unsafe condition to be able to take corrective actions. B. Knowledge of required corrective action procedures.	C. Knowledge of accident documentation procedures.
Safety Training	A. Skill in developing and/or delivering safety training per guidelines.	B. Knowledge of health and safety education requirements.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Maintain a safe and productive work area		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	3.42	Input all safety and health training into data base to guarantee proper documentation
		Use computerized data collection to identify accident trends/areas that need to be evaluated for correction and elimination
		Use computers to access training programs
		Use PowerPoint presentations to conduct safety orientations
		Use computer to track safety training
Gathering and Analyzing Information	3.13	Gather, analyze and compare present safety conditions to past
		Visually inspect work area for possible safety hazards
		Collect information on safety audits and accident logs to identify improvement opportunities and corrective actions
		Gather information on who is in need of safety training
		Gather information from injury reports to determine repeated injuries from dangerous equipment in order to make corrections
Analyzing and Solving Problems	3.34	Identify safety issues to recommend corrective actions
		Select proper personnel protective equipment for the job to prevent injuries
		Analyze safety inspection reports to help implement a corrective action plan
		Identify areas or tasks where most injuries occur to suggest modifications to process, layout or job rotations in order to eliminate injuries
Making Decisions and Judgments	3.65	Decide on the list of priorities necessary for training of personnel in emergency response situations
		Determine that all safety equipment and guards are in place
		Identify unsafe conditions
		task
		Determine the frequency of safety training and drills
Organizing and Planning	3.47	Organize safety drills to ensure worker safety
		Plan and organize safety and environmental inspections in order to prevent accidents
		Plan the appropriate timing of emergency drills
		Plan emergency drills to prepare for threats to health or safety
Using Social Skills	3.55	Communicate to the production supervisor that a safety issues exists and critical process must be stopped until a remedy is found
		Interact with peers to share info on emergency drills/procedures

		Interact with new employees on importance of safe work environment in order to make a positive
		Give feedback to a co-worker in order to communicate a safer way to perform an operation or task
Adaptability	3.13	Change method of production to achieve safer outcomes
		Change to a new safety procedure in order to comply with new safety law requirements
		Change the production process to temporarily work around an unsafe area or condition
		Be able to respond to different types of emergencies
Working in Teams	3.58	Work with co-workers to identify and report unsafe conditions
		Work with all team members to conduct effective fire/safety/emergency drills
		Meet and discuss conditions that are thought to be unsafe in order to make everyone aware
Leading Others	3.55	Correct potential safety issues when discovered, to make co-workers aware of how issues should be addressed
		Encourage a more participative approach to safety issues
		Lead by example to show no repercussion of notification of possible unsafe conditions
		Lead others to work safely by emphasizing safe practices
		Build a common theme of "safety-first" among workers to ensure a safe work environment
Building Consensus	3.00	Explain how to correct an unsafe condition without offending the affected workers
		Review potential or existing safety concerns and build consensus by discussing potential actions needed to resolve them
		Facilitate agreement on safety procedures in order to assure entire team follows the agreed-upon process
		Create consensus upon emergency procedures and specific people's responsibilities
		Build consensus on what level of safety training is needed
Self and Career Development	2.93	Learn about hazardous material specs to prevent injury
		Attend in-house operator safety seminars
		Identify learning opportunities in environmental laws and technology to improve safety
		Acquire CPR and first-aid training
Speaking	3.48	Present safety policies and procedures to other employees in order to understand the importance of safety
		Express concerns to management about unsafe work environment
		Present accurate and cogent presentations to new hires and trainees in safety subjects
		Present safety training to co-workers when new work processes are implemented
		Discuss environmental issues with supervisor in order to avoid accidents and unsafe conditions

Quality Assurance
Academic and Employability Skill Examples

Listening	3.44	Listen to descriptions of safety policies and procedures in order to avoid accidents
		Listen to the concerns of the employee in order to identify ergonomics improvements needed
		Receive feedback from employees as it pertains to safety in a respectful and attentive way
		Listen to employees identifying potential safety hazards and take corrective actions
Writing	3.21	Post written warnings about unsafe conditions
		Write accurate accident injury reports
		Document clear procedures for safety practices
		Document equipment safety checks in safety log book
		Document safety incident and training orientation
		Document corrective actions regarding safety
Reading	3.63	Read warning labels to identify potentially hazardous materials
		Read information on emergency procedures
		Read MSDS forms to protect self and others
		Read company safety policies and procedures
		Read machinery and product instructions in order to safely use them
		Read safety and environmental standards to perform inspections
Math	2.31	Tabulate safety incidents
		Calculate the safe volumes of contamination
		Measure the distances needed to maintain safe tolerances in the workplace
		Measure content of lead in painted surfaces
		Calculate production quantities against accident rates to ensure that demand doesn't create unsafe workplace
Science	3.21	Understanding of how the body is impacted by ergonomics in order to make workstation more comfortable and safe
		Understanding of potential chemical hazards
		Knowledge of basic electrical systems to prevent electrocution

QA8

Critical Work Function: Maintain quality and implement continuous improvement processes.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Perform periodic internal quality audit activities	All audit forms are completed correctly in a timely manner. Forms are forwarded to the correct parties. Audit data is relevant and correct. Conformances to quality standards are properly assessed and documented. When appropriate, audit includes observation of operation to ensure performance meets specifications. Audit is performed in accordance with company and other required schedules and procedures.
Check calibration of gauges and other data collection equipment	Calibration schedule is implemented according to specifications. Instrument certification is checked both by reviewing documentation and through careful observation during use. Instruments that are out of calibration are immediately recalibrated or referred to the appropriate parties for recalibration or repairs.
Suggest continuous improvements	Potential improvements are generated through observation and data analysis. Suggestions communicate measurable and data-driven benefits to the company, its customers and employees. Suggestions are made according to proper procedures and documentation. Suggestions show that all data was reviewed prior to making recommendation.
Inspect materials at all stages of process to determine quality or condition	Sampling and inspection occur according to schedule and procedures. Inspection tools and procedures are selected and used correctly. Materials are inspected against correct specifications. Materials that do not meet specification are correctly identified. Corrective action is taken on out-of specification material. Inspection results are properly documented. Inspection results are reported to correct parties.
Document the results of quality tests	Data forms are checked to ensure that they are complete and accurate. Information is evaluated and interpreted correctly. Data is forwarded to correct parties. Correct analytical tools are selected and used properly.
Make adjustments to restore or maintain quality	Appropriate corrective actions are identified and approvals received when needed. Adjustments are made to eliminate deviations and bring the process back into control. Adjustments are made in a timely manner. Adjustments are properly documented.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**M**	**M**	Complexity of mathematics content	Number sense and computation	**M**
				Geometry, measurement, and spatial sense	**M**
				Complexity of data analysis, statistics, and probability	**M**
				Functions and algebraic thinking	**M**
				Complexity of representation and communication	**M**
			Complexity of problem solving	Mathematical methods	**M**
				Mathematical reasoning	**M**
				Mathematical tools	**M**
Science	**NA**	**L**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**M**
				To inform	**M**
				To persuade	**M**
Listening	**L**	**M**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**L**
			Barriers to communication	Limitations on interaction	**L**
				Distractions	**M**
Speaking	**M**	**M**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**L**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Com-munications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**M**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**M**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**M**	**M**	Problem complexity	Problem uniqueness or difficulty	**M**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**M**	**M**	Degree of judgment or inference required	Lack of guidance or precedents	**M**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**M**
Organizing and Planning	**M**	**M**	Complexity of plans	Goal complexity or ambiguity	**M**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**M**
				Lack of feedback	**M**
				Constraints on resource availability	**M**
Using Social Skills	**L**	**M**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**L**
				Tact and sensitivity required	**L**
Adaptability	**M**	**M**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**M**
Working in Teams	**M**	**M**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**M**
				Lack of clarity or stability of responsibilities	**M**
Leading Others	**L**	**M**	Work challenges	Challenges to goal attainment	**L**
				Work structuring requirements	**M**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**L**	**M**	Consensus process inhibitors	Number and diversity of stakeholders	**M**
				Ambiguity of goals	**M**
				Lack of organizational support, incentives, or consensus leadership	**L**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**M**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**L**
Self and Career Develop-ment	**L**	**M**	Need for learning and development	Self and career development requirements	**M**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**M**
				Application constraints	**L**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality Process	A. Skill in set-up and inspection to improve production and maintain quality. B. Knowledge of how to identify good products and non-conforming products. C. Skill in inspecting materials, and labeling and returning non-conforming materials. D. Knowledge of company quality assurance procedures. E. Knowledge of quality management systems and how to use them to perform quality checks.	F. Knowledge of inspections to perform and evaluate process. G. Knowledge of how to fill out inspection sheets. H. Knowledge of how to read production documents. I. Skill in interpreting test results. J. Knowledge of basic material specifications and properties to inspect materials. K. Knowledge of data from check sheets, quality charts and statistical methods charts to be able to better control process. L. Knowledge of corrective actions that need to be reported.
Quality Documentation	A. Knowledge of inspection procedures for handling non-conforming material. B. Knowledge of how to use route sheets and statistical method charts to document process.	C. Knowledge of test equipment calibration compliance. D. Knowledge of how to complete appropriate quality forms. E. Knowledge of follow-up and reporting procedures to ensure proper communications.
Continuous Improvement Process	A. Knowledge of new and advanced technology in the industry. B. Knowledge of how to collect and analyze data to recommend improvements. C. Knowledge of production system and machinery to suggest process improvements.	D. Knowledge of statistical methods charts to ensure that process is under control. E. Knowledge of which parties should be notified of recommended for continuous improvement. F. Knowledge of the causes of excessive waste and scrap.
Inspection Tools	A. Skill in verifying calibration of inspection equipment. B. Knowledge of how to chose the appropriate analytical methods to interpret test data. C. Knowledge of appropriate automated inspection system.	D. Skill in evaluating the characteristics of a finished product against specifications. E. Skill in using hand-held inspection devices to examine materials. F. Skill in maintaining and storing inspection tools.
Calibration	A. Knowledge of the calibration standards, requirements, and equipment.	B. Knowledge of environmental impact that effect calibration requirements.
Manufacturing Process	A. Knowledge of manufacturing processes and how equipment operates. B. Knowledge of specifications and requirements of products being produced.	C. Knowledge of procedures for handling and storing materials and products. D. Knowledge of the basic properties of the materials used in the process.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Maintain quality and implement continuous improvement processes		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	3.60	Use computer system to track gauge calibration schedules and results of quality checks
		Use CAD to design better fixtures and processes to produce quality parts in a timely fashion
		Use calculator to conduct audits and ensure product quality at different stages of the production cycle
		Use PC to create and maintain audit documentation
		Use Access data base to collect field and in-house data in order to identify failure trends and point to areas for improvement opportunities
Gathering and Analyzing Information	3.94	Gather information from product samples to monitor conformance to specifications and to determine if machine adjustments are necessary
		Verify that all fixtures, tools, blueprints, and process sheets are current and conform to latest revision
		Solicit operator inputs to resolve problems and quality improvements
		Interpret all spec charts to understand their impact on the final product
		Check all inspection equipment
Analyzing and Solving Problems	3.81	Anticipate future quality control problems and make proactive adjustments in order to maintain quality products
		Keep records of all jobs to see if all stations uphold top quality at all times
		Analyze results of quality audits and recommend changes for problem areas
		Take part in problem solving/solution implementation activities
Making Decisions and Judgments	3.91	Determine when production must be stopped if it isn't meeting specifications
		Identify the corrective action necessary to bring a process back into control
		Decide if calibration is out-of-date and when recalibration is required
		Determine when and where to inspect or audit process for quality of product or process to meet customer requirements
		Decide if a product is within tolerances
Organizing and Planning	3.53	Organize and maintain measuring equipment calibrations
		Organize team to review quality stats and brainstorm possible solutions
		Plan periodic adjustments to machinery to recalibrate due to vibration
		Schedule inspection of production at all critical stages
Using Social Skills	3.56	Conduct audits in a non-threatening manner by explaining the reason for the audit

Quality Assurance
Academic and Employability Skill Examples

		Meet with fellow employees and discuss business needs in a professional manner
		Communicate the importance of quality and customer satisfaction in order to maintain a competitive edge
		Communicate results of audits to employees in a tactful way to bring awareness of areas for improvement
Adaptability	3.63	Change production and inspection method to improve product quality
		Show receptivity to alternative process methods that may improve productivity and reduce scrap
		Adapt behavior to accommodate quality requirements on different lines and with different products
		Adapt to new communication technologies to assure production and quality delivery
Working in Teams	3.90	Participate with other departments in solving quality issues
		Work with all team members to develop new ideas for process improvements
		Collaborate with team members to integrate new processes and improvements
		Work on cross-functional teams to identify continuing improvement needs
Leading Others	3.52	Show co-workers production methods to improve quality and give credit to the right employee
		Lead co-workers to positive work improvement ideas and follow up on them
		Encourage co-workers to check parts for quality
		Coach a co-worker on techniques that improve quality results
		Influence line workers to take appropriate corrective actions as identified
Building Consensus	3.41	Build consensus by brainstorming all potential C.I. Projects in order to prioritize them and begin implementation
		Have all workers collectively agree what is quality, how to define it and express the theme that quality means jobs
		Work with team members to develop consensus on corrective action implementation plan
		Build consensus on the importance of inspection to determine quality or condition
		Create agreement that proper documentation of processes will help analyze areas that need improvement and provide insight on how to effect positive change
Self and Career Development	3.21	Take a course on quality tools used by the company (e.g., SPC or statistics)
		Attend classes on SPC
		Acquire skills in new quality inspection technology to improve quality
		Increase certifications to help maintain highest level of quality
Speaking	3.34	Participate in discussions/brainstorming sessions targeted at productivity and quality improvements

Quality Assurance
Academic and Employability Skill Examples

		Present ideas for continuous improvements calmly and clearly
		Provide feedback on work performance that will maintain and improve performance
		Express concerns regarding work processes
		Communicate to the set up person the adjustments needed to bring a process into control
Listening	3.69	Listen to the ideas of others in a non-judgmental manner to realize the greatest gain from the CI process
		Listen to the ideas of others with an open mind
		Receive feedback from supervisor on quality of work in an appropriate way
		Listen to customers to obtain knowledge of product uses
		Listen to employees' concerns over production process
		Listen to suppliers in order to gain knowledge of product development and updates
Writing	3.64	Write test records for quality control and non-conformance reports
		Fill out reject material reports clearly and precisely
		Complete audit forms
		Create detailed log of calibration of gauges and other data collection equipment
Reading	4.00	Review procedures or suggested changes to comment on their effectiveness
		Read calibration manuals and be able to implement corrective actions
		Read audit reports
		Read vendor publications and training manuals to stay apprised of current developments
		Read shift-to-shift communications to understand what stage the process is in
		Read quality test procedures to test product
Math	3.83	Use math to produce charts on department quality levels
		Perform cost/benefit analysis to determine if a CI idea is cost effective
		Determine if a part is acceptable based on actual vs. dimension/tolerance specifications
		Estimate material usage to ensure adequate supply of materials
		Calculate equipment calibration
Science	2.82	Knowledge of potential hazards of epoxy paints
		Knowledge of chemical reactions
		Understand principles of chemistry to adjust finishing processes to meet specs
		Conduct air quality test equipment calibration to ensure worker safety

QA9

Critical Work Function: Communicate with co-workers and/or external customers to ensure production meets business requirements.

Critical work functions *describe the major responsibilities involved in carrying out a concentration*

Concentrations *are the major areas of front-line work covering families of related jobs. Separate standards were identified for each concentration.*

Key Activities **Key activities** *are the duties and tasks involved in carrying out a critical work function*	Performance Indicators **Performance indicators** *correlate to the key activities. The performance indicators provide information on how to determine when someone is performing each key activity competently*
Communicate safety, training and job-specific needs	Communication is sufficient to ensure that safety issues are understood and safety practices used. On-the-job issues and concerns are discussed and quickly resolved. Current and future training issues are identified in a timely way. Communication demonstrates knowledge of customer and business needs. Communication is clear and relevant to the situation. Communication is made in a timely and accurate manner to the correct parties. Issues are evaluated, tracked and reported back to original communicator. Communications are tracked and documented, as appropriate.
Communicate material specifications and delivery schedules	Communication reflects knowledge of material specifications. Delivery schedules are clearly communicated. Communication demonstrates knowledge of customer and business needs. Communication is clear and relevant to material and delivery issues. Communication is made in a timely and accurate manner to the correct parties. Material and delivery issues are evaluated, tracked and reported back to original communicator. Communications are tracked and documented, as appropriate.
Communicate quality requirements, issues and training	Communication reflects knowledge of quality requirements. Quality issues are raised in a timely way. Quality issues are addressed in a timely way. Communication demonstrates knowledge of customer and business needs. Communication is clear and relevant to quality. Communication is made in a timely and accurate manner to the correct parties. Quality issues are recorded, and tracked and reported back to original communicator. Communications are tracked and documented, as appropriate.
Communicate production requirements and product specifications	Communication reflects knowledge of production requirements, levels, and product specifications. Communication is initiated cross-functionally as required to meet production requirements, product specifications, or other customer or business needs. All parties are notified of production issues and problems in a timely way. Communication demonstrates knowledge of customer and business needs. Communication is clear and relevant to production and products. Issues are evaluated, tracked and reported back to original communicator. Communications are tracked and documented, as appropriate.

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	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Math	**NA**	**L**	Complexity of mathematics content	Number sense and computation	**NA**
				Geometry, measurement, and spatial sense	**NA**
				Complexity of data analysis, statistics, and probability	**NA**
				Functions and algebraic thinking	**NA**
				Complexity of representation and communication	**NA**
			Complexity of problem solving	Mathematical methods	**NA**
				Mathematical reasoning	**NA**
				Mathematical tools	**NA**
Science	**NA**	**L**	Complexity of scientific inquiry	Design	**NA**
				Use of evidence	**NA**
			Complexity of understanding the nature of science	Unifying concepts and processes	**NA**
			Complexity of core scientific content	Physical science	**NA**
				Life science	**NA**
				Earth and space science	**NA**
			Complexity of applied science	Science and technology	**NA**
				Science in personal and social perspective	**NA**
Reading	**M**	**M**	Complexity of text		**M**
			Complexity of reading skills		**M**
			Complexity of reading purpose		**M**
Writing	**M**	**M**	Complexity of text	Complexity of text	**M**
			Complexity of writing product	Type of product	**M**
				Organization	**M**
				Elaboration	**M**
			Complexity of writing process	Writing development	**M**
				To inform	**M**
				To persuade	**M**
Listening	**M**	**H**	Complexity of communication	Content complexity	**M**
				Demands on attention	**M**
				Communication indirectness	**M**
			Barriers to communication	Limitations on interaction	**M**
				Distractions	**M**
Speaking	**M**	**H**	Complexity of communication	Content complexity	**M**
				Tact and sensitivity required	**M**
				Communication indirectness	**M**
			Context demands	Diversity of audience	**M**
				Constraints on preparation	**M**
				Distractions	**M**
				Listener resistance	**M**
Using Information and Communications Technology	**M**	**M**	Complexity of technology application	Complexity of equipment or technology	**M**
				Complexity of applications	**L**
				Training time constraints	**M**
			Frequency of technology change	New learning required	**M**
Gathering and Analyzing Information	**M**	**M**	Difficulty of information gathering	Amount of information	**M**
				Number and variety of sources	**M**
				Resourcefulness needed	**M**
			Complexity of analysis	Complexity of information and analysis	**M**
				Need to evaluate source information	**M**
				Lack of analysis guidelines	**M**

ACADEMIC AND EMPLOYABILITY SKILLS

Skill	Overall Complexity Rating for Workers	Overall Complexity Rating for Supervisors	Complexity Dimension	Complexity Subdimension	Complexity Subdimension Rating for Workers
Analyzing and Solving Problems	**L**	**L**	Problem complexity	Problem uniqueness or difficulty	**L**
				Number and range of problems	**M**
			Solution complexity	Number and complexity of possible solutions	**M**
Making Decisions and Judgments	**L**	**L**	Degree of judgment or inference required	Lack of guidance or precedents	**L**
				Integration difficulty	**M**
				Quantity or ambiguity of risks and consequences	**M**
			Individual decision-making responsibility	Accountability and autonomy	**M**
				Absence or ambiguity of rules or policy constraints	**L**
Organizing and Planning	**M**	**M**	Complexity of plans	Goal complexity or ambiguity	**M**
				Flexibility required	**M**
				Resource coordination required	**M**
				Scope and effects of planning	**M**
			Constraints on planning	Lack of guidelines	**M**
				Lack of feedback	**M**
				Constraints on resource availability	**M**
Using Social Skills	**M**	**H**	Complexity of social interactions	Diversity	**M**
				Structure or protocol required	**M**
				Tact and sensitivity required	**M**
Adaptability	**M**	**M**	Degree of adaptability required	Frequency of change	**M**
			Difficulty of adapting	Unpredictability of change	**M**
				Lack of support for change	**M**
Working in Teams	**M**	**M**	Degree of collaboration required	Task interdependence	**M**
			Team member heterogeneity	Team diversity	**M**
			Goal or role ambiguity	Lack of clarity or support for team goals	**M**
				Lack of clarity or stability of responsibilities	**M**
Leading Others	**M**	**M**	Work challenges	Challenges to goal attainment	**M**
				Work structuring requirements	**M**
				Scope and complexity of leadership responsibility	**NA**
			People challenges	Coaching or monitoring needs	**NA**
				Conflict management needs	**M**
Building Consensus	**M**	**M**	Consensus process inhibitors	Number and diversity of stakeholders	**M**
				Ambiguity of goals	**M**
				Lack of organizational support, incentives, or consensus leadership	**M**
				High consensus standard	**M**
			Difficulty of issues requiring consensus	Complexity of issues	**M**
				Contentiousness of issues	**M**
				Lack of opportunities for agreement	**M**
Self and Career Develop-ment	**NA**	**L**	Need for learning and development	Self and career development requirements	**NA**
			Limitations on learning and development opportunities	Time, resource, or support constraints	**NA**
				Application constraints	**NA**

Overall complexity ratings: The *overall* level of complexity required in a skill in order to perform the critical work function. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. Two separate ratings are provided: one for *workers* (entry-level up to first-line supervisors) and the other for *supervisors* (first-line supervisors). In some cases, the overall complexity rating was **NA (Non-Applicable)**. This means that this skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.
Complexity Subdimension ratings: These are complexity level ratings for individual aspects of the particular skill. *Scale*: H=high complexity; M=moderate complexity; and L=low complexity. At this time, these ratings are provided for workers only. In some cases, the subdimension complexity rating was **NA (Non-Applicable)**. This means that this *particular dimension* of the skill was deemed not to be needed to perform this given critical work function, so no complexity rating was assigned.

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 Category	Specific Knowledge and Skills	Specific Knowledge and Skills
Quality	A. Knowledge of quality concepts and how to resolve them in a way that meets business requirements. B. Knowledge of third party quality testing to ensure materials meet specifications. C. Skill in completing a non-conforming product form to get approval for proper material disposition.	D. Knowledge of material specifications. E. Skill in interpreting quality requirements, industry standards, and documentation requirements. F. Knowledge of traceable documentation.
Scheduling	A. Skill in calculating time estimates for jobs. B. Knowledge of schedules and how to access schedules of customers or suppliers.	C. Knowledge of how to complete a requisition form to order job-related material.
Safety	A. Knowledge of safety issues and practices, including Occupational Safety and Health Administration (OSHA) regulations, to take or recommend action.	B. Knowledge of how to use Material Safety Data Sheets (MSDS). C. Knowledge of company reporting forms and documents and procedures specific to safety.
Business Policies and Procedures	A. Knowledge of which company forms to use when communicating. B. Knowledge of company organizational structure to communicate with correct parties.	C. Knowledge of customer and business needs in order to communicate effectively.
Manufacturing Process	A. Knowledge of product production specifications and productivity requirements. B. Knowledge of customer requirements. C. Knowledge of order size and materials requirements.	D. Knowledge of production process to meet business requirements. E. Knowledge of material tracking and handling procedures. F. Knowledge of the basic terminology used in the workplace.

Quality Assurance
Academic and Employability Skill Examples

Critical Work Function: Communicate with co-workers and/or external customers to ensure production meets business requirements		
Knowledge/skill	**Mean Importance**	**Examples**
Using Information and Communication Technology	3.84	Use overhead projectors and computers to train employees in the safe operation of equipment
		Use phone to communicate with customers on quality and deliver times
		Post production schedule on Excel spreadsheet to monitor and track progress to commitment
		Use phone/fax and email to relate material specifications
		Use computerized reports to share production and quality information with production workers
Gathering and Analyzing Information	3.48	Gather and analyze data on hazardous process that may become safety concern
		Communicate change orders from sales staff to production floor
		Communicate shift to shift problems and concerns to help ensure efficiency
		Gather information on product functionality and materials in order to communicate and address production needs
		Gather production quantities and stock amounts to schedule overtime
Analyzing and Solving Problems	3.57	Analyze production bottlenecks to suggest alternate plans
		Review daily quality output stats with team
		Identify possible hazards in order to eliminate time loss injury
		Analyze material needs to ensure production can be met
Making Decisions and Judgments	3.29	Determine with the customer any deviations from specs that are acceptable
		Determine what communications are needed in order to meet production requirements
		Determine the time to completion in order to move product from one station to next
		Determine cause of conflict between clients and coworkers and determine corrective action
Organizing and Planning	3.63	Plan to have operators info-share quality concerns/issues between departments and shifts
		Organize meetings in order to communicate all production requirements
		Organize training to meet the needs of the worker in order to maximize results
		Organize and plan routine communication with customers
Using Social Skills	3.94	Suggest improvements to employees using examples of how to implement them without insulting the workers
		Encourage cooperation between peers to establish good communication among operators
		Meet with contractors in a professional manner to discuss challenges
		Contact line workers in a friendly and enthusiastic manner to communicate safety and job specific needs

Quality Assurance
Academic and Employability Skill Examples

Adaptability	3.68	Express receptivity to shared input from co-workers
		Be flexible to ever-changing customer needs and requirements
		Quickly accommodate to changing environments and conditions in order to maintain quality and production
		Demonstrate sensitivity to customer's changing delivery schedule
Working in Teams	3.93	Meet with outside vendor to ensure that product specs and delivery times are completely understood
		Pass along information to co-workers concerning production demands issues and possible solutions
		Team with co-workers to communicate potential hazards to one another
Leading Others	3.60	Provide peer training on problem solving techniques
		Motivate employees through positive affirmations rather than intimidation and fear
		Provide recognition for work well done
		Become a spokesperson for department by evaluating areas of concern
		Provide timely feedback to an operator encountering performance problems
Building Consensus	3.41	Work with operators to collectively agree on process quality, product quality, and produce specs so that there are no differences
		Work with team to reach consensus on today's work assignments based on skills training and team member preference
		Facilitate agreement about quality, schedules and production to best format team assignments
		Resolve any performance issues in a positive manner to accomplish long-term production goals
		Create agreement by having all parties communicate regarding quality requirements and issues
Self and Career Development	2.73	Identify training courses offered by the company in order to meet with the business's requirements
		Self educate on customer and corporate goals and policies
		Share knowledge and ask for feedback from customers
		Attend training about communicating material specifications and delivery schedules
Speaking	4.00	Communicate to the set up person the adjustments needed to bring a process into control
		Communicate to other employees quality requirements and production requirements
		Present training sessions to employees on new production processes
		Give oral production reports to co-workers of other shifts or departments to maintain goals
Listening	3.77	Listen to the concerns of co-workers regarding product specifications and requirements for improvements
		Listen to concerns of staff to better provide training
		Listen to the perspective of all team members in order to see the overall view of the issue

Quality Assurance
Academic and Employability Skill Examples

		Receive feedback from co-workers on job performance in an appropriate way
Writing	3.39	Complete a material requisition form when parts are needed
		Write change orders and document changes
		Document into quality system the defects in parts produced
		Write reports and memos to staff regarding changes in requirements
		Prepare a written schedule of work production for shipping
		Correspond during shift change to relate problems, tasks, etc. of ongoing production
Reading	3.89	Read communications written by fellow workers on corrective action to process
		Review customer product specifications and requirements and relate them back to peers
		Read RFIs and their related materials and paraphrase into specific orders/requests of co-workers and clients
		Read material specifications and delivery schedules
Math	2.93	Calculate scrap and rework data for reports
		Perform measurements to verify parts meet customer requirements
		Compare invoice to delivery
		Calculate downtime caused by part shortage
		Calculate weights of materials and delivery issues
Science	2.48	Knowledge of proper disposal of chemicals
		Understand actual needs of product in relation to the environment it will be used