APPENDIX
A.11

CORE COMPETENCY REQUIREMENTS AND NIMS CREDENTIALS

NIMS CERTIFIED CNC OPERATOR - MILLING AND TURNING

I. CNC Operator – Milling and Turning: Basic Competencies

Core Competency Assessment: CNC Operator – Milling and Turning Basic Competencies

Task Code	Task	Date Completed	Supervisor Signature
A	*Inspect Materials & Parts*		
A1	Measure and Verify Length, Width & Diameter of Raw Materials		
A5	Measure Material Thickness		
A13	Record Quality/Compliance (Inspection) Data		
A15	Measure ID/OD		
A19	Weigh Parts		
A20	Verify & Test Calibration of Inspection Instruments		
B	*Plan Job & Prepare for Production*		
B13	Stage Material, Tooling & Fixtures at Work Center		
B14	Inspect Crane/Hoist & Rigging for Safety and Function		
C	*Maintain CNC Milling/Turning Equipment*		
C1	Check Level & Replenish Coolants/Oils		
C2	Check Coolant Cleanliness & Adjust Concentration		
C3	Check & Replenish Hydraulic/Way-Lube Fluids & Spindle Oils		
C4	Check/Empty Tramp Oil Collectors		
C5	Monitor/Adjust Coolant Chillers		
C6	Change Filters		
C7	Empty & Segregate Chips		
C9	Check & Tighten Tooling		
C10	Grease Chucks & Vises		
C11	Replace Probe Batteries		
C12	Check Lockouts & Safeguarding Devices for Function		
C13	Cleanout Inside of Machine		
C15	Clean Tool/Mill Carousel		

Core Competency Assessment: CNC Operator – Milling and Turning Basic Competencies (cont.)

Duty Area	Task	Date Completed	Supervisor Signature
D	*Set-up CNC for Milling Operations*		
D9	Check/Verify & Position Delivery of Coolants and Fluids		
D10	Start & Home Mill, Run Warm-up Cycle & Shut Down Mill		
D18	Set-up Chip Bins/Containers		
D19	Set-up Packaging/Staging for Finished Parts		
E	*Set-up CNC for Turning Operations*		
E16	Check, Position & Verify Delivery of Coolant & Fluids for Turning Operations		
E17	Start-up & Home Machine for Turning Operations, Run Warm-up Cycle & Shut Down		
E23	Set-up Chip/Scrap Bins or Containers		
E24	Set-up Packaging or Staging to Finished (Turned) Parts		
F	*Operate & Control CNC Milling Processes*		
F1	Load, Feed & Unload Milled Work pieces		
F3	Replace (or Identify) Worn Tooling (Milling)		
F8	Empty Chip Bins/Containers		
F9	Tag Milled Parts for Traceability		
F12	Perform Benchwork on Milled Parts		
F13	Housekeep Work Center/Work Station		
F14	Package/Stage Finished Milled Parts		
F15	Conduct Shift Change & Exchange Information		
F16	Shutdown CNC Milling Process		

Core Competency Assessment: CNC Operator – Milling and Turning Basic Competencies (cont.)

Duty Area	Task	Date Completed	Supervisor Signature
G	*Operate & Control CNC Turning Processes*		
G1	Load, Feed & Unload Turned Work pieces		
G7	Control Chip Flow & Empty Chip Bins or Containers		
G8	Tag Turned Parts for Traceability		
G9	Separate Good Turned Parts From Bad Parts		
G10	Collect Run/Production Data & Information (Turning Operations)		
G11	Benchwork Turned Parts		
G12	Housekeep Work Center/Work Station		
G13	Package/Stage Finished Turned Parts		
G14	Conduct Shift Change Duties & Exchange Information (Turning Operations)		
G15	Shutdown CNC Turning Operations		
H	*Perform Benchwork*		
H1	Deburr Finished Parts		
H2	Deburr/Clean Raw Materials		
H3	Tap Holes		
H4	Hone Holes		
H6	Wash/Clean/Degrease Parts		
H7	Assemble & Fit Components Onto Part		
H8	Prepare Parts for Secondary Operations		
H9	Lap Parts		
H10	Polish Parts		
H11	Engrave, Stamp or Etch Part ID's or Spec's on Work pieces		
H12	Apply Protective Coatings or Material to Parts		

CNC OPERATOR – MILLING AND TURNING: INTERMEDIATE COMPETENCIES

Duty Area	Task	Date Completed	Supervisor Signature
A	*Inspect Materials & Parts*		
A2	Determine Hardness of Materials		
A3	Identify Materials by Type		
A4	Review Part Prints & Identify Critical Dimensions (match part to print)		
A6	Measure Part Features, Profiles & Dimensions Optically or Comparatively		
A7	Measure Surface Finish		
A8	Measure Threads		
A9	Measure Bores		
A10	Measure Tapers		
A11	Measure Radius/Radii		
A12	Measure GD&T		
A14	Measure Point-to-Point Distances (e.g., hole-to-hole)		
A16	Measure Temperature of Parts		
A17	Measure Part/Feature Height/Depth		
A18	Measure Angles		
B	*Plan Job & Prepare for Production*		
B1	Determine Type of Tooling for Job		
B2	Obtain & Stage Tooling at Work Center		
B3	Determine Workholders		
B4	Identify Raw Material Needs for Job		
B5	Obtain, Review & Verify Part Print and Job Packet		
B7	Determine Appropriateness & Availability of Equipment		
B8	Identify CNC Program to be Downloaded		
B10	Order or Obtain Raw Material & Tooling		
B15	Obtain & Stage Inspection & Gaging Devices		
B17	Check Machine for Pre-Production Maintenance Needs		
B18	Determine Packaging or Staging for Finished Parts		

Core Competency Assessment: CNC Operator – Milling and Turning Intermediate Competencies (cont.)

Duty Area	Task	Date Completed	Supervisor Signature
C	*Maintain CNC Milling/Turning Equipment*		
C8	Check Draw Bar Force		
C14	Clean Machine Tool Tapers		
D	*Set-up CNC for Milling Operations*		
D1	Install & Indicate Workholding Fixtures		
D2	Pre-Set or Assemble Tooling		
D3	Install/Set Tooling		
D4	Update Tool Offsets		
D5	Update Work Offsets		
D6	Load/Download CNC Programs		
D7	Dry Run/Prove-Out CNC Programs		
D8	Load First Article Work piece to be Milled		
D13	Run First Piece(s)		
D14	Inspect First Piece part(s)		
D16	Adjust/Edit Tool Offsets & Work Offsets		
D17	Establish Cycle Time		
D20	Verify Milled Parts Quality and Compliance (inspect parts)		
E	*Set-up CNC for Turning Operations*		
E1	Install/Indicate Chucking Devices		
E2	Install/Indicate Turning Workholding Fixtures		
E3	Bore Soft Jaws		
E4	Install "Live" Tooling		
E5	Pre-Set or Assemble Tooling (Turning)		
E6	Prepare, Adjust & Load Bar Feeder		
E7	Position/Adjust Tail Stock		
E8	Install/Set Tooling (Turning)		
E9	Update Tool Offsets (Turning)		
E10	Update Work Offsets (Turning)		
E11	Load/Download CNC Turning Programs		
E12	Dry Run/Prove-Out CNC Turning Programs		
E14	Set/Verify Hydraulic Pressures		
E15	Load First Article Work piece for Turning Operations		
E18	Turn First Part(s)		
E19	Inspect First Piece part(s)		
E21	Adjust/Edit Tool & Turning Work Offsets		
E22	Establish Cycle Time (Turning)		
E25	Verify (Validate) Part Cosmetics, Quality & Compliance		

Core Competency Assessment: CNC Operator – Milling and Turning Intermediate Competencies (cont.)

Duty Area	Task	Date Completed	Supervisor Signature
F	*Operate & Control CNC Milling Processes*		
F2	Index/Change Tooling (Milling)		
F4	Establish Tool Life Benchmarks (Milling)		
F5	Inspect Milled Parts for Compliance While Adhering to Frequency of Inspections		
F6	Monitor, Adjust & Control Milling Process		
F7	Control Chip Flow		
F10	Separate Good Milled Parts from Bad Parts		
F11	Collect Run Data & Information (Milling)		
F17	Re-Start CNC Milling Process		
G	*Operate & Control CNC Turning Processes*		
G2	Index/Change Tooling (Turning)		
G3	Identify/Replace Worn Tooling (Turning Operations)		
G4	Establish Tool Life Benchmarks (Turning Operations)		
G5	Inspect Turned Parts in Accordance With Inspection/Process Plan		
G6	Monitor, Control & Adjust Turning Processes		
G16	Re-Start CNC for Turning Operations		
H	*Perform Benchwork*		
H5	Extract Broken Tooling Manually		
J	*Troubleshoot Equipment & Compliance/Quality Problems (Selected Examples)*		
J2	Find Out Why Tooling Has Broken or Showing Premature Wear		
J3	Find Out Why Holes Are Oversized		
J4	Isolate the Cause Why Concentricity is Out of Tolerance		
J5	Respond to (Isolate the Cause of) Over or Under Sized Threads		
J6	Isolate the Cause of Machine Control Alarms		
J7	Respond to (Isolate the Cause of) Missing or Out-of-Tolerance Features on a Part		
J8	Find Out Why Part Has Excessive Burr		
J9	Determine Why Machine Won't Start or Re-Start		
J10	Find Out Why a Part Left or Moved Out of Workholder or Fixture		

CNC OPERATOR – MILLING AND TURNING: ADVANCED COMPETENCIES

Duty Area	Task	Date Completed	Supervisor Signature
B	*Plan Job & Prepare for Production*		
B12	Determine Sequence of Machining & Secondary Operations		
B16	Calculate Machinability Data		
D	*Set-up CNC for Milling Operations*		
D11	Calibrate Spindle & Tool Probes		
D12	Program Independent Rotary Head/Indexer		
D15	Adjust/Edit Milling CNC Programs		
E	*Set-up CNC for Turning Operations*		
E13	Calibrate Tool & Turret Probes (Optional)		
E20	Adjust/Edit CNC Turning Programs		
J	*Troubleshoot & Compliance/Quality Problems (Selected Examples)*		
J1	Determine Why Chatter Has Occurred		

Required NIMS Credentials

In order to demonstrate proficiency in all of the competencies listed in this appendix, the apprentice will have completed all of the following NIMS Credentials.

Name of Credential	Date Completed	Supervisor Signature
Measurement, Materials and Safety		
Job Planning, Benchwork and Layout		
CNC Operations - Milling		
CNC Operations - Turning		