This is a customized training pathway developed by East Mississippi Community College for Yokohama Tire Manufacturing Mississippi. The training pathway was developed through the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program Round 3 Grant Golden Triangle Modern Manufacturing Project TC-25149-13-60-A-28.

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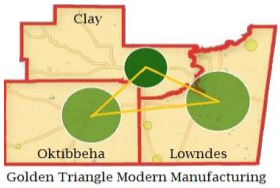
East Mississippi Community College
Golden Triangle Modern Manufacturing Project



Final Yokohama Customized Training Plan - Action 1.4 Add capacity at the Golden Triangle campuses in Clay and Lowndes Counties to provide credential-based, non-credit customized training and credit training, and demonstrate non-credit to credit articulation based on those credentials. Activity - Develop a start-up customized training plan for Yokohama Tire Manufacturing Mississippi.
Relevant Deliverable – Final customized training program for Yokohama

Five customized training pathways were developed for the customized training plan for Yokohama Tire Manufacturing Mississippi (YTMM). The company remains pleased with the current training plan.

1. Incumbent Management and Staff Training Plan
2. Incumbent Technician Training Plan
3. Non-Incumbent Technician Training Plan
4. Incumbent Production Worker Training Plan
5. Non-Incumbent Yokohama Production Worker Training Plan

The content for each of the five pathways is shown below.

1. Incumbent Management and Staff Training Plan

A. Each participant referred to training by Yokohama is required to take the CRC career readiness assessment. Each must obtain a silver level or better credential.
B. Each participant is required to take the Manufacturing Skills Basic class. Each must achieve an overall score of 80% or better. Components of the class include:
    - Basic Computer Literacy
    - Safety and 10-hour OSHA
    - CPR
    - Blue Print Reading
    - Precision Measurement
    - Introduction to manufacturing improvement methods
    - Lean Manufacturing
    - Quick changeover
    - 5S
    - Teamwork
    - Problem-solving
    - High Performance Manufacturing
C. Each participant is required to take the OSHA 30-hour training program and obtain the OSHA 30-hour certificate.
D. Participants may also be given individual prescriptions to take some or all of the following training modules (also see pathways chart at end of this document). Instruction is delivered online with EMCC staff managing the course of study prescribed by the Yokohama management team. Knowledge assessments and skills check-offs are scheduled and completed at EMCC.

I. Lean Manufacturing

- Workplace Organization
- 5S expanded
- Total Productive Maintenance (TPM)
- Poka-Yoke Mistake Proofing
- Lean theory, Principles and people
- Introduction to Lean
- Visual Factory
- Standardized Work
- Kaizen
- Value Stream Mapping
- Single minute exchange of dies (SMED)
- Internal and external Task
- Streamlining Task

II. GD&T Geometric Dimensioning and Tolerances

- Dimensioning
- Rules ASME 14.5
- Tolerances
- Feature Control Frames
- Material Modifiers
- Geometric Tolerance Zones
- Datum's
- Alternate Datum
- Form Tolerances
- Profile Tolerances
- Orientation Tolerances
- Runout Tolerances
- Location Tolerances

III. Quality

- Purpose of Gauges
- Calibrating and Master Gauges
- Variable Analog Gauges
- Variable Digital Gauges
- Micrometers
- Go/No Go Gauges
- Thread Gauges
- Attribute Gauges
- Care and Storage of Gauges
- Surface Plates
- Gauge Blocks
- Test Indicators
- Height Gauges
- Surface Texture
- Profilometers
- Hardness

- Quality Systems
- International Standards
- ISO/TS 16949
- Quality Tools

IV. <u>Processes and Materials</u>

- Torque
- Fittings, Couplings, Hose and Tubing
- Injection Mold design
- Plastics: Part Design and Material Selection
- Blow Molding Design
- Injection Molding Operation
- Plastics: Chemistry and Properties
- Blow Molding Operation
- Extrusion Operation
- Material Quality Control
- Tensile Strength
- Data Acquisition
- Material Design
- Compression, Shear and Hardness
- Design Evaluation
- Contamination Control and Prevention
- Fasteners
- Introduction to CAD/CAM

V. <u>Various components of Electro-Mechanical Technician Skills</u>

- Electrical Systems
- Industrial Wiring
- Electric Motors
- Motor Controls
- Electrical Drives
- Programmable Logic Controllers (SLC500)
- Programmable Logic Controllers (Control Logix)
- Mechanical Systems and Drives
- Mechanical Drives
- Mechanical Fabrication
- Pneumatics
- Hydraulics
- Manual Machining
- CNC Machining

2. Incumbent Technician Training Plan

A. Each participant referred to training by Yokohama is required to take the CRC career readiness assessment. Each must obtain a silver level or better credential.
B. Each participant is required to take the Manufacturing Skills Basic class. Each must achieve an overall score of 80% or better. Components of the class include:

- Basic Computer Literacy
- Safety and 10 hour OSHA
- CPR
- Blue Print Reading
- Precision Measurement
- Introduction to manufacturing improvement methods
- Lean Manufacturing
- Quick changeover
- 5S
- Teamwork
- Problem-solving
- High Performance Manufacturing

C. Each participant must take the OSHA 30-hour training program and must obtain the OSHA 30-hour certificate.

D. Participants may also be given individual prescriptions to take some or all of the following training modules (also see pathways chart at end of this document). Instruction is delivered online with EMCC staff managing the course of study prescribed by the Yokohama Management team. Knowledge assessments and skills check-offs are scheduled and completed at EMCC.

I. <u>Electrical Systems</u>

- Basic Electrical Circuits
- Electrical Measurement
- Circuit Analysis
- Inductance and Capacitance
- Combination Circuits
- Transformers
- Control Logic
- Sequencing Control
- Timers and Advanced Systems
- Introduction to Electrical Wiring
- Residential Wiring System Components
- Service Connections and Circuit Protection

II. <u>Industrial Wiring</u>

- Raceways
- Conduit Bending
- Conductors, Disconnects and Over Current Protection
- Conduit Sizing and Wire Pulling Techniques
- Electrical Control Wiring
- Electrical Control System Wiring
- Pneumatic Control Circuit Wiring

III. <u>Electric Motors</u>

- DC Generators
- Wound Rotor Machines
- Alternators
- Synchronous Motors

IV. Motor Controls

- Introduction to Motor Controls
- Manual Motor Controls
- Control transformers
- Control Ladder Logic
- Control Relays and Motor Starters
- Troubleshooting
- Reversing Motor Control
- Automatic Input Devices
- Timer Controls
- Breaking Methods
- Reduced Voltage Starting Circuits
- Power Generation and Distribution
- Electronic Sensors
- Timers and Counters

IV. Electrical Drives

- Variable Frequency Drives
- Speed and Torque
- Acceleration and Deceleration
- Troubleshooting
- SCR Motor Controls
- AC Drives
- A-B Power Flex 70 Drive
- Control Parameters
- Communication
- Troubleshooting
- Servo Drives

V. Programmable Logic Controllers (SLC500)

- Basic Programming
- PLC Motor Controls
- Discrete I/O Interfacing
- PLC System Troubleshooting
- Event Sequencing
- Application Development
- PLC Timers
- PLC Counters
- Program Control Instructions
- Math and Data Moves Instructions

VI. Programmable Logic Controllers (Control Logix)

- Basic Programming
- PLC Motor Controls
- Discrete I/O Interfacing
- PLC System Troubleshooting
- Event Sequencing
- Application Development

- PLC Timers
- PLC Counters
- Program Control Instructions
- Math and Data Moves Instructions

VII. Mechanical Systems and Drives

- Levers
- Linkages
- Cams
- Turnbuckles
- Pulley Systems
- Gear Drives

VIII. Mechanical Drives

- V-Belt Drives
- Synchronous Belt Drives
- Lubrication
- Shaft Alignment
- Couplings
- Chain Drives
- Bearings
- Gaskets and Seals
- Gear Drives Selection and Maintenance
- Key Fasteners
- Power Transmission Systems
- Spur Gears Drives
- Multi Shaft Drives

IX. Mechanical Fabrication

- Threaded Fasteners
- Wrenches
- Pneumatic System Fabrication
- Screw Drivers
- Pliers and Locking Devices
- Mallets and Non-Threaded Fasteners
- Torque Wrenches
- Portable Power Tools

X. Pneumatics

- Power Systems
- Circuits
- Principles of Pressure and flow
- Speed control
- Air Logic
- Maintenance
- Electronic Sensors
- Moving Loads
- Vacuum Systems
- Air Compressors

- Electrical Control Systems
- Control Devices
- Power Devices
- Control relays
- Sequencing Controls
- Timer Control
- Pressure Control
- Circuit Applications

XI. Hydraulics

- Hydraulic Power Systems
- Hydraulic Circuits
- Principles of Pressure and flow
- Speed control
- Pressure Control Circuits
- Cylinder Applications
- Relief Valve Operation
- Check Valve Applications
- Accumulators
- Hydraulic Motors
- Hydraulic Pumps
- Fluids

XII. Manual Machining

- Precision Measurement Tools
- Manual Lathes
- Lathe Operation
- Turning Operation
- Manufacturing Hand Tools
- Manual Milling
- Milling Operation
- Band Saw Operation
- Drill Press Operation
- Safety and PPE

XIII. CNC Machining

- CNC Mill Programming
- Circular Interpolation
- Speeds and Feeds
- Mill Canned Cycles
- CNC Mill Cutter Compensation

3. Non-Incumbent Technician Training Plan

To be considered for hire, each non-incumbent technician must complete a comprehensive assessment (see below). Yokohama refers individuals to EMCC for assessment. EMCC's expert instructors rate individuals on a scale of 0 to 5 in each area. Following assessment, Yokohama determines whether to hire an individual or

not. Those hired continue customized training by participating in the Incumbent Technician Training Plan (see above).

Maintenance Technicians – will be assessed in the following technical areas.

1. SMAW Arc Welding
2. GMAW ”Mig” weld
3. Metal Cutting Oxy-fuel
4. Shaft Alignment
5. Pneumatic Systems
6. Hydraulics Systems
7. Electrical - For, Rev, Jog Circuit
8. Programmable logic controllers
9. Blueprint Reading
10. Measurements

Boiler Technicians -will be assessed in the following technical areas.

1. Boiler Systems
2. Pipe Threading & Fitting
3. Shaft Alignment
4. Pneumatic Systems
5. Hydraulics Systems
6. Electrical - For, Rev, Jog Circuit
7. Programmable logic controllers
8. Blueprint Reading
9. Measurements

Electrical/Electronic Technicians - will be assessed in the following technical areas.

1. PID Loop Flow Control
2. PID Loop Level Control
3. PID Loop Pressure Control
4. PID Loop Troubleshooting
5. Variable frequency drives
6. Electrical - Motor Connections
7. Electrical - For, Rev, Jog Circuit
8. Programmable logic controllers Binary Conversion
9. Programmable logic controllers Program Development

4. Incumbent Production Worker Training Plan

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- Precision Measurement

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- Material Quality Control
- Tensile Strength
- Data Acquisition
- Material Design
- Compression, Shear and Hardness
- Design Evaluation
- Contamination Control and Prevention
- Fasteners
- Introduction to CAD/CAM

V. Pneumatics

- Power Systems
- Circuits
- Principles of Pressure and flow
- Speed control
- Air Logic

- Maintenance
- Electronic Sensors
- Moving Loads
- Vacuum Systems
- Air Compressors
- Electrical Control Systems
- Control Devices
- Power Devices
- Control relays
- Sequencing Controls
- Timer Control
- Pressure Control
- Circuit Applications

VI. <u>Hydraulics</u>

- Hydraulic Power Systems
- Hydraulic Circuits
- Principles of Pressure and flow
- Speed control
- Pressure Control Circuits
- Cylinder Applications
- Relief Valve Operation
- Check Valve Applications
- Accumulators
- Hydraulic Motors
- Hydraulic Pumps
- Fluids

5. Non-Incumbent Yokohama Production Worker Training Plan

Yokohama non-incumbent participant must complete the following to be considered for employment at YTMM.

1. Each participant referred to training by Yokohama is required to take the CRC career readiness assessment. Each must obtain a silver level or better credential.
2. Each participant is required to take the Manufacturing Skills Basic class. Each must achieve an overall score of 80% or better. Components of the class include:
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    - 5S
    - Teamwork
    - Problem-solving

- High Performance Manufacturing

Workforce Online/Blended Manufacturing Skills Pathways