SCIENTIFIC MANAGEMENT TECHNIQUES, INC.

Unique Testing and Training Solutions for Industry
Solving the Skills Crisis by Helping Manufacturers Identify, Train, and Keep the Best People

Forty Six Years of Success Improving Industrial Performance & Profitability in 39 Countries Across a Wide Variety of Manufacturing Platforms

Scientific Management Techniques is the Global Leader in "HANDS-ON" Industrial Skills Assessment Programs and Skills Training Programs. World-Class manufacturing organizations deploy SMT's programs to improve workforce skills and drive performance and profitability in their production facilities.

SMT's four decades of experience working with the global manufacturing workforce translates into a wealth of data and understanding unmatched by any other organization.

These programs are unique, validated, proven highly effective in thirty-nine countries and deliver a Return-On-Investment in excess of 100% the first year of implementation. Powerful Productivity Tools.

COMPETENCY-BASED "MANUFACTURING SKILL ASSESSMENT MACHINES"

This scientific-based, data-driven program simplifies the hiring process. The solution lowers the risk and cost of hiring and aligns the hiring process with industrial lean/TPM initiatives. With the Assessment Machines our clients know the skill set/skill level of each candidate prior to hire.

Identifying and measuring the skills required to **operate**, **maintain** and **troubleshoot** your facility is the single most effective way to ensure a quality hire and drive industrial performance. **Many organizations assess their incumbent workforce and deliver highly targeted training based on the assesment data.**

FIVE HANDS-ON "MANUFACTURING SKILL ASSESSMENT MACHINES"

Mechanical Skills • Electrical Skills • PLC Skills • CNC Skills • Process Control Skills

As the skills shortage grows more acute each year and margin pressures mount it's more critical than ever before to make the right hiring decision. SMT's industrial skills Assessment Machines and Assessment Protocols are used in the hiring process for the selection and evaluation of maintenance mechanics, machine operators, industrial electricians, PLC technicians, electro-mechanical personnel, CNC operation personnel and process control technicians. Many Fortune 500 manufacturers will not hire without using SMT's assessment programs.

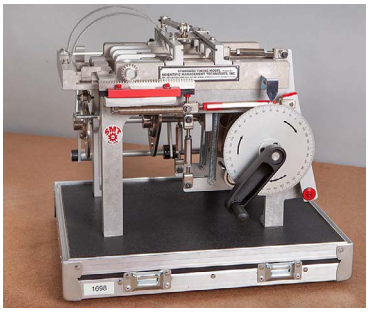
- **Hire the Right Skill Sets**
- **Improve Performance & Profitability**
- **Identify Problem Solving Skills**
- **Lower the Risk & Cost of Hiring**
- **Measure Competencies and Instinct**
- **Minimize Downtime**
- **Avoid the Bad Hire**
- **Train the Skills Required to Optimize Performance**
- **Identify Troubleshooting Ability**
- **Identify Trainability**
- **Impact Lean, Six Sigma, & TPM Programs**
- **Separate Candidates by Skill Level**
- **Match the Right Person with the Right Job**
- **Reduce Employee Turnover**

If you're hiring without identifying skills in advance you may be accepting risks that can be easily avoided.

WWW.SCIENTIFIC-MANAGEMENT.COM

19 Star Drive, Suite E • Merrimack, NH 03054, USA • 603-421-0222

Mechanical Skills Assessments *Identify troubleshooting ability*



The Standard Timing Model (STM) is our Mechanical Skills Assessment Machine. This process identifies and measures pre-existing skill sets/skill levels and is also used to identify mechanical aptitude. The particular assessment used is a function of the position being staffed. The STM delivers a Maintenance Level Assessment used when hiring industrial maintenance professionals and an Operator Level Assessment for hiring experienced operators and identifying aptitude in entry level candidates.

The STM identifies and measures a broad range of mechanical skills. Collectively, the skills identified represent Mechanical Troubleshooting Ability; the ability to analyze and define causes of malfunctions in machinery and solve them quickly and correctly.

PLC Skills Assessments *Separate candidates and incumbents by skill level*

Our PLC Test Device (PLCTD) is engineered to test and train hardware technicians and PLC programmers. It will identify the troubleshooting skills of industrial equipment maintenance personnel. Much more than a written aptitude test, the PLC Testing Device is hands-on, providing direct feedback from a test panel.

The testing device evaluates job candidates and incumbents in the positions of maintenance personnel, technicians, and programmers responsible for the upkeep and troubleshooting of automated production lines and automated production equipment. It provides a clear indication of candidate's PLC troubleshooting strengths and weaknesses.

Electrical Skills Assessments *Impact Lean, Six Sigma & TPM Initiatives*

Our Electrical Skills Test Device (ESTD) is designed to screen and train for industrial electricians and electro-mechanical production positions. The device provides a means of quantitatively screening candidates for industrial electrician positions, for use in evaluating job applicants and as a grading device for training purposes.

The ESTD resembles an industrial control panel as closely as possible in a portable device and was designed in a joint effort by an electrical engineer and a training director who realized the difficulty of evaluating the abilities of electricians.

CNC Skills Assessments *Lower the risk and cost of hiring*

The CNC Test Device (CNCTD) is designed to screen and train for CNC setup operators with production responsibilities. The device provides a means of quantitatively screening for CNC setup operator positions, for use in evaluating job applicants and as a grading device for training purposes.

The CNC Selection-Evaluation Assessment program takes the uncertainty out of the hiring process. No longer will hiring managers need to ***hope*** a candidate possesses the skills and experience they represent. The assessment program separates individuals by skill levels, identifying the strongest candidates to drive productivity in your facility.

Process Control Skills Assessment

Avoid the bad hire

The Process Control Test Device (PCTD) is used to screen and train individuals in the area of Process Control Technology and Applications. The device identifies existing skill sets in the fundamental Process Control elements of Pressure, Temperature, Flow and Level. Using the device candidates will be able to configure, tune and control a process loop as it applies to real world process applications. With the PCTD there are both Basic and Advanced level assessments, the specific assessment used is a function of the position being staffed.

The PCTD assessment machine and testing protocols will identify and measure a candidates pre-existing skill sets and pinpoint specific process control training needs.

PARTIAL ASSESSMENT & TRAINING CLIENT LIST

Nestlé

TESLA

Remington

JPS INDUSTRIES, INC.

KRONES

Firestone

SQUARE D Schneider Electric

ALCOA

Unilever

CENTRIA

gsk GlaxoSmithKline

HEXCEL

SYLVANIA

P&G

SONOCO

SUNCOR ENERGY

DIAMOND OFFSHORE

GRACE

tyco

Cargill

MERCK

OSHKOSH TRUCK CORPORATION

Cummins

BUNGE

MECHATRONICS TRAINING PROGRAM

"Basic and Advanced Mechanical, Electrical, PLC and Process Control Training"

Proven to Dramatcally Improve Industrial Performance and Profitability

THIS PROGRAM TRAINS THE CRITICAL "HARD SKILLS" REQUIRED TO OPERATE, MAINTAIN, AND TROUBLESHOOT A MODERN MANUFACTURING FACILITY.

SCIENTIFIC MANAGEMENT TECHNIQUES (SMT) HAS BEEN EFFECTIVELY SOLVING THE INDUSTRIAL SKILLS SHORTAGE FOR MANY YEARS WORKING WITH MANUFACTURERS ACROSS A WIDE VARIETY OF INDUSTRIAL PLATFORMS.

SMT's industrial skills training program is a competency based hands-on, 100% demand-driven program. The curriculum has been built by and for industrial operation professionals. These manufacturing leaders possess an in-depth understanding of the skills required to optimize performance….these are the skills we train to.

Training in industry is driven by two primary objectives; 1) deliver highly effective training that will immediately impact Productivity/Profitability, and 2) deliver the training efficiently in order to get manpower back into production as soon as possible. This is the environment our curriculum has been built in and designed for; highly effective training delivered in a reasonably short period of time.

The curriculum can be characterized as a continuous "needs analysis" of the skills required to operate, maintain, and troubleshoot a modern manufacturing facility. We work closely and continuously with our industrial clients regarding the skills they require to maximize performance. We improve existing units and design new curriculum based on **real-time identified needs.**

This is a hands-on competency based training program incorporating the use of over 200 hands-on training aids. Students train on the same tools, components, and systems they will encounter in industry.

"I was introduced to SMT's standard timing model in the early 90's as a plant maintenance manager and used it as a very effective screening tool for hiring. In subsequent roles as plant manager I brought the tool in not only for hiring but also as a training tool for our TPM programs with great effect. Operators were able to see the interaction of cams, gears, drives and take this learning directly to improving their own maintenance and operation in my factories. We also had great success with your electrical testing module, again for both screening and training. I have used SMT for years and this company has great and proven products, training and techniques."

Unilever

"We have been using SMT's tools at Sonoco to help us make better hiring decisions for over 15 years. Within that time frame, the overall technical skills of our entire maintenance organization have increased considerably. Here at Sonoco, we made a conscious decision many years ago to hire better-qualified maintenance employees. These tools not only helped us pick the best candidates, but also established a baseline that all candidates must exceed in order to be hired. This hiring process, applied over that many years, has been a huge benefit to Sonoco."

Sonoco Products Company

WWW.SCIENTIFIC-MANAGEMENT.COM

19 Star Drive, Suite E • Merrimack, NH 03054, USA • 603-421-0222

Scientific Management Techniques, Inc.

Measuring the Impact of SMT's Skill Training Program

Output or Production • By Employee • By Line • By Shift • By Cell Unit: Output or production by unit of measure. (Units/Shift) Direction: Maximize	Total Output by Unit of Capacity **AVG Improvement 27%**

Maintenance Overtime • By Employee • By Line • By Shift • By Cell Unit: OT Hours Incurred Direction: Minimize	Total Number of Overtime Hours by Unit **AVG Improvement (decrease in overtime) 59%**

Quality • By Employee • By Line • By Shift • By Cell Unit: Percentage Direction: Maximize	$Quality = \frac{Good\ Pieces}{Total\ Pieces}$ **AVG Improvement 21%**

Downtime • By Employee • By Line • By Shift • By Cell Unit: Percentage Direction: Minimize	$Downtime = 1 - \frac{Availability}{100} * 365 * 24 * 60$ **AVG Improvement (decrease in downtime) 44%**

Each training unit consists of a student study guide, student test booklet, many power points, hands-on training aid kit, and an instructor guide.

Level One – Basic Mechanics Training Program

Volume 1: Shop Mathematics
- **Unit 1:** Base 10, Decimals, Decimal Equivalents, Percentages
- **Unit 2:** Fractions
- **Unit 3**: Algebraic Expressions, Simple Equations, Ratio, Proportion
- **Unit 4:** Graphs, Charts, Data Handling
- **Unit 5:** Weights, Measures, Metric Conversion
- **Unit 6:** Exponents, Square Roots, Right Triangles
- **Unit 7:** Angles, Plane Figures, Area
- **Unit 8:** Measurement of Solid Figures, Volume, Intro. To Trig.
- **Unit 9:** Trigonometric Tables

Volume 2: Blueprint Reading & Machine Drawing
- **Unit 1:** Elements of Blueprints and Machine Drawing I

Volume 3: Measurement
- **Unit 1:** Linear Measurement

Volume 4: Hand Tools
- **Unit 1**: Care and Use of Hand Tools
- **Unit 2:** Mechanical Fasteners

Volume 5: Basic Mechanical Components I
- **Unit 1:** Basic Machines
- **Unit 2:** Shafts, Couplings, Pulleys, Belts and Chain Drives
- **Unit 3:** Gears and Gear Ratios
- **Unit 4**: Advanced Couplings
- **Unit 5**: Basic Alignment

Volume 6: Bearings & Lubrication
- **Unit 1:** Principles of Bearing Operation, Components, Bearings
- **Unit 2:** Principles of Friction and Lubricants

Volume 7: Basic Mechanical Components II
- **Unit 1**: Levers, Cranks, Linkages, and Springs
- **Unit 2:** Types and Uses of Cams, Timing Adjustments
- **Unit 3:** Use of Elementary Timing Model in Timing Adjustments

Volume 8: Machine Adjustment Fundamentals Using The ATM
- **Unit 1:** Troubleshooting, Problem Solving, and Problem Identification Techniques
- **Unit 2:** Set Up Machine Standards Using the ATM
- **Unit 3:** Problem Solving on Multiple Systems Using the ATM

Volume 8-A: Basic Pneumatics & Hydraulics
- **Unit 2A:** Air Compression, Properties of Air
- **Unit 2B:** Basic Pneumatics, Compressors, and Air Pressure Gauges
- **Unit 3A:** Hydraulic Flow and Control

Volume 9: Electrical Components
- **Unit 1:** Principles of Electricity, AC & DC Circuits
- **Unit 2:** Basic Circuit Components, Switches, and Relays
- **Unit 3:** Digital Multimeter, Basic Measurements
- **Unit 4:** Input and Output Devices
- **Unit 5:** Electrical Schematics
- **Unit 6:** Generators & Transformers
- **Unit 7:** DC Machines
- **Unit 8:** Three-Phase AC & DC Motors

Volume 10: Pump Basics
- **Unit 1:** Pumping Basics

Volume 11: Valve Operation & Types
- **Unit 1:** Valve Operation and Type

Vol 11A: Basic Process Control
- **Unit 1:** Introduction to Process Control
- **Unit 2:** Basic Definitions
- **Unit 3:** Pressure
- **Unit 4:** Temperature
- **Unit 5:** Level
- **Unit 6:** Flow
- **Unit 7:** Analytical Instruments and Terminology
- **Unit 8:** Transmitters
- **Unit 9:** Controllers
- **Unit 10:** Process Control and Control Loops
- **Unit 11:** Control Schemes

Level Two – Advanced Mechanics Training Program

Volume 12: Introduction to Industrial Maintenance
- **Unit 1:** Failure Analysis

Volume 13: Gearbox Maintenance
- **Unit 1:** Gear Maintenance

Volume 14: Bearing Maintenance
- **Unit 1:** Bearing Maintenance

Volume 15: Advanced Pneumatic Fundamentals
- **Unit 1:** Control Components, Pneumatic Drives
- **Unit 2:** Circuit Design

Volume 16: Advanced Hydraulic Fundamentals
- **Unit 1:** Control Components, Hydraulic Drives
- **Unit 2:** Circuit Design

Volume 17: Advanced Electrical
- **Unit 1:** Capacitors
- **Unit 2:** Inductors
- **Unit 3:** Power in AC Circuits
- **Unit 4:** Electrical Troubleshooting Using the ESTD
- **Unit 5:** Troubleshooting, AC Motors
- **Unit 6:** Troubleshooting, DC Motors

Volume 18: Pump Maintenance
- **Unit 1:** Pump Maintenance

Volume 19: Introduction to Welding
- **Unit 1:** Welding Safety
- **Unit 2:** Gas Welding, Cutting, and Heating
- **Unit 3:** Introduction to Arc Welding, MIG - TIG

Volume 20: Machine Shop Practices
- **Unit 1:** Machine Shop Safety
- **Unit 2:** Hand Tools and Bench Work
- **Unit 3:** Metal Cutting
- **Unit 4:** The Lathe
- **Unit 5:** The Milling Machine
- **Unit 6:** The Drilling Machine
- **Unit 7:** The Grinding Machine

Volume 21: Advanced Machine Adjustment Fundamentals Using the PMS
- **Unit 1:** Troubleshooting, Problem Solving, and Problem Identification Techniques
- **Unit 2:** Set Up Machine Standards Using The Packaging Machine Simulator
- **Unit 3:** Problem Solving on Multiple Systems Using the Packaging Machine Simulator

Volume 22: Ladder Logic
- **Unit 1:** Basic Ladder Logic
- **Unit 2:** Planning and I/O Symbols
- **Unit 3:** Numbering Systems, Codes, and Logic
- **Unit 4:** Symbols and Ladder Logic Basics
- **Unit 5:** Ladder Logic Format
- **Unit 6:** Program Functions
- **Unit 7:** Program Examples
- **Unit 8:** Glossary of Terms

Volume 23: PLC Advanced Electrical
- **Unit 1:** Introduction to the PLC
- **Unit 2:** PLC Programming and Operation
- **Unit 3:** Maintenance and Troubleshooting

VOLUME 24: Advanced Process Control
- **Unit 1:** Process Control- Intro Advanced
- **Unit 2:** Advanced Pressure
- **Unit 3:** Advanced Level
- **Unit 4:** Advanced Flow Measurement
- **Unit 5:** Advanced Temperature
- **Unit 6:** Analytical-PH
- **Unit 7:** Advanced Actuators
- **Unit 8:** Advanced Process Control-Frequency Drives
- **Unit 9:** Heat Exchangers
- **Unit 10:** Hazardous Applications
- **Unit 11:** Flowmeter Installation
- **Unit 12:** Instrument Calibration