SOFTWARE

- Work Measurement - Speed Estimator Pro™ is a quick and economical tool to produce labor standards. The program uses standard data which can be applied to a majority of common manufacturing work elements to produce standards in a fraction of the time needed for detailed time study or application of other higher-priced tools. Use pre-synthesized times for tool use sequences or “macro” motion groupings, build a study from scratch, or use your own data.

Machine Shop Pro™ is a quick and easy-to-use development tool for metal-cutting labor standards. Automatic standards calculation for drilling, tapping, turning, reaming, slab milling, and band and power hacksaw operations. Select desired feeds, speeds, and other parameters, then click a button for standard times.

- Learning Curve Applications - CURV1™ is an outstanding program for estimators, engineers, and managers. Some features include: 1) the Quick Calculator that solves for curve slope, first unit (T1), or Nth Unit; 2) the Regression tool that fits curves to “actuals” input by the user, and; 3) instant calculation of learning curve factors for any slope and range of units and quick references for common curve formulae for True Lot Midpoints, exponents of slope, and other terms. Plus, a Technical Glossary and “Tips of the Day.” BREAK™ is a companion program to CURV1 that evaluates the cost penalties associated with discontinuities in manufacturing. These so-called “production breaks” are a classic estimating problem, and this program is a classic and user-friendly solution.

- Assembly Line Balancing – Flexible Line Balancing™ finds the absolute most cost-effective allocation of labor tasks in any progressive assembly line. Solve for line speed or number of workstations. Move elements to create “what if...?” scenarios. Instantly create precedence diagrams, color-coded by workstation. Full cut, paste, import, and edit capabilities. Capability to define work elements as sequential, independent, grouped, off-line, or with other constraints.


- Ergonomics Software - N-LIFT™ is a compact and easy-to-use program that quickly calculates optimum manual lifting loads using the NIOSH lifting equation (single task). N-LIFT uses all factors of the NIOSH analysis to determine Lifting Index (LI) and Recommended Weight Limit (RWL) for manual materials handling.

CLIENTS (partial list)

| Allied Bendix | General Motors | LTV | Lucas Western |
| Ball Corporation | GM of Canada | Lucas Western |
| BellSouth | Honeywell | Messier-Dowty | Northrop Grumman |
| Boeing | IBM | Olin Corporation | Pratt & Whitney |
| Celotex Corporation | Ingersoll-Rand | Pratt & Whitney | Raytheon |
| CF Gomma USA Inc. | Jo-Ann Stores | Shell Chemical | Remington-Rand |
| Conax Corporation | Kaman Aerospace | Texas Instruments | Remington-Rand |
| Crane Merchandising | Learjet | Thienol | Remington-Rand |
| E-Systems | Litton | Thiokol | Remington-Rand |
| Ford Motor Company | Lockheed Martin | Tracor Aerospace | Remington-Rand |
| Ford of Canada | Loral Aerospace | Visteon Poland, S.A. | Remington-Rand |

INDUSTRIAL ENGINEERING and MANAGEMENT SERVICES

CONSULTING
- Quality
- Productivity

TRAINING PROGRAMS

CONTRACT ENGINEERING
- Industrial
- Quality
- Value

SOFTWARE AND MANAGEMENT SYSTEMS

PRODUCTION TECHNOLOGY
Since 1983 © 2002
INTRODUCTION

Production Technology has provided professional consulting, training, and contract services since 1983. We have provided service in Industrial, Quality, and Value Engineering disciplines to manufacturers, service industries, educational institutions, and government agencies. We assist in organizing, planning, and implementing productivity and quality improvement at all organizational levels. We offer substantial experience in quality management, factory and office systems, cost analysis and estimating, and performance measurement. In addition to services, Production Technology offers several unique and cost-effective software tools for business management and labor control.

In summary, we can respond to virtually any area of interest involving cost, quality or productivity improvement. We look forward to providing any detailed additional information you may require, or a specific cost proposal.

CONSULTING and CONTRACT SERVICES

- Establishing standards, standard data, and labor performance measurement systems for large and small business, including the use of Predetermined Method/Time Systems (PMTS) and computer-based cost estimating systems.

- Custom designed productivity audits of manufacturing operations, focusing on methods and processes, workflow, tooling and equipment, procedures, costing, and factory systems.

- Facility planning and plant layout, including equipment placement, workflow, and space planning.

- Assembly process definition and labor cost estimating to support new product design and/or new business proposals. Complete proposal management services to support government or public sector procurements.

- Development of productive methods and systems for factory and office; application of Industrial Engineering tools to the workplace.

- Planning and implementation of a self-managing team process and systems for manufacturing, process, and service industries. Programs typically include design, goal- and mission-setting, training, policies, procedures, workplace surveys, teambuilding and problem-solving.

- Analysis of workplace hazards and ergonomic practices, including review of workplace compliance to the Americans with Disabilities Act. Design and development of custom ergonomics analysis checklists for risk avoidance.

- Development of job analyses, job descriptions, and evaluation of compensation plans.

- Short- or long-term contract services in Industrial, Quality, Value, or Manufacturing Engineering.

- Custom training programs in any productivity-related topic.

ON-SITE TRAINING PROGRAMS

Production Technology on-site training programs offer a unique combination of well-researched materials and professional presentation, plus the business and engineering experience to tailor classroom discussion to the user. Programs make extensive use of videotapes and participative demonstrations and exercises. A complete set of class materials in a student workbook is provided to each attendee. Courses listing variable length may be tailored to client need within those limits.

Industrial Engineering Techniques 24 to 40 Hours

Industrial Engineering Techniques is normally presented in five consecutive days. The program provides new engineers, supervisors, non-IEs, and other technical and non-technical personnel a grounding in classical Industrial Engineering methods and procedures. The program relies heavily on interactive demonstrations, teamwork, video, and class exercises. This program has been presented many times for automobile manufacturers and OEM suppliers, and uses numerous video examples of real plant scenes in fabrication and assembly operations. The overall program consists of several modules that may be added or deleted to produce a program duration of 24 to 40 hours. In some of the major topics include:

- Flow and Process Charting
- Right and Left Hand Analysis
- Operator/Machine Charting
- Performance Rating
- Motion Economy Principles
- Ineffective Worker Movements
- Workplace Layout
- Ergonomic Principles
- Work Sampling
- Stopwatch Time Study
- Precedence Charting
- Line Balancing

Teambuilding 16 Hours

The Teambuilding workshop is a two-day session that provides “everything you ever wanted to know” about organizing and operating a team-based organization. Tools, techniques, procedures, and time schedules are discussed...a complete primer on how to turn groups of loosely-organized and non-communicative employees into team players with common goals. While this program isn't a “miracle cure” (your top-level commitment is necessary), it is a great start to understanding the differences between groups and teams and putting a teamwork plan into effect. A fun program with much interaction and role-playing. Uses material from “Total Quality and Teambuilding: A Guidebook to TQM Success.”

Basic Work Measurement 8 to 24 Hours

The Work Measurement program focuses on the principles and practice of stopwatch time study, teaching the proper procedures and “etiquette” to use in performing a statistically valid study. The program is tailored for new IEs, time study technicians, factory supervisors, and anyone needing a primer on how to evaluate worker output with a watch. Substantial time is spent on “Fair Day’s Work” concepts and the performance expectations (speed and pace) of a “normal” operator. There are many exercises in performance rating, and several simulated stopwatch time study exercises in the session. Some time is also spent in reviewing popular current Predetermined Method/Time Systems (PMTS). Participants should provide their own stopwatches in the custom style of decimal hour or decimal minute time study watches.

Ergonomics and Workplace Design 8 Hours

Discusses workplace design as it relates to human characteristics and capabilities. Includes hand tool design, workplace dimensional sizing, occupational health and safety issues, principles of motion economy, ineffective worker movements, fatigue and work capacity, and repetitive stress trauma, including carpal tunnel syndrome. Multiple classroom demonstrations and video examples.

Assembly Line Balancing 8 Hours

Assembly Line Balancing introduces line balancing principles and procedures to factory supervisors and managers, IEs and other engineers, line leaders, or any others with need to logically structure the sequence and position of manufacturing assembly operations. There is full discussion of several types of powered and unpowered lines, and terminology such as “banking” and “floating.” After introduction, participants are given several exercises in which to establish balances, and finish the day working on several variations of a complex problem. The program also contains a demonstration of Flexible Line Balancing™, a premier software tool for assembly line balancing.

Value Engineering 16 to 24 Hours

Value Engineering has been developed for design and manufacturing engineers, IEs, production managers, and anyone involved with producibility issues. The program is unique in that it introduces VE principles and procedures and then reinforces the lessons with work on actual projects, preselected by teams of participants. Projects selected may involve paperwork and procedures, design of new hardware, or redesign of an existing product. Teams composed of multiple disciplines are the best approach in this session. If projects are extremely complex, a three-day session may be required. Also, because of the need to preselect projects and gather relevant data, this program requires more than average lead time in scheduling.

Learning Curve Workshop 16 Hours

Learning Curve Theory and Application is designed for cost estimators, pricing analysts, IEs, production and production managers, buyers, financial managers and accountants. The workshop shows how to use learning curves to estimate costs and price and negotiate agreements with customers or suppliers. This program has been presented to literally thousands of professionals since inception in 1975. Many exercises are used, with attendees working and discussing multiple estimating problems. Participants are also given a free copy of Production Technology's curve software, CURV™ for Windows.

Current all-inclusive training program prices are listed at the Production Technology web site, (http://www.protech-ie.com/specials.htm/).

All-inclusive pricing includes all classroom materials, student notebooks, presentation fee, and all associated travel and expenses for any US location (contiguous 48 states) for up to 12 attendees. For more attendees (up to 25, depending on subject), additional workbooks are $35 to $50 each.