

JD GRAY ASSOCIATES -TYPICAL INSTALLATIONS-

**Heatcraft Refrigeration Products LLC
30 North Magnolia Road
Tifton, Georgia 31794**

Assist in the transformation of a progressive gravity roller assembly conveyor for commercial air conditioner products to a paced assembly system utilizing two (approximately) fifty feet long by three feet wide indexing linear slider bed conveyors with preset dwell time PLC control panels, pause buttons and traverse warning lights.

Industrial Engineering activity included on-site time study of eight families (different build sequences) on six fan sizes; equipment specifications, forty-eight optimum and sixteen alternative line balances; work station layout, part bills of material, parts containerization, visual aids, task instructions and tooling; on-site crew training and system implementation.

System recently installed but once new crews are cross trained and work order schedules fixed and overhead suspended shelves and feed-in gravity conveyors in place a 30% direct labor hour savings is projected.

**Operations Concepts, Incorporated
900 N Kings Highway
Cherry Hill, NJ 08034
DJFRAMPTON1@YAHOO.COM**

Performed return-on-investment analysis for six divisions of major HVAC Corporation to determine consolidation feasibility. Industrial Engineering activity included time study, conceptual layout, conceptual equipment specification and costing, cost versus savings and report. Detailed implementation activity including snap back time study, line balancing, workstation layout, departmental layout and precision indexing rotary table equipment specification for two of the above six divisions. Direct labor savings of 50%.

Productivity analysis for National Distribution Center. Industrial Engineering activity included time study for kiting and shipping operations and assisted in design of plant wide materials handling system.

**ATI Allegheny Ludlum
Precision Rolled Strip Products
1357 E. Rodney French Boulevard
New Bedford, Massachusetts 02742**

Provided the industrial engineering design of a variable gain sharing incentive plan affecting ninety-four direct and indirect plant wide hourly factory workers in a coiled steel processing facility.

Development of *primary measurement* alternatives

- Pieces output
- Machine uptime
- Man hours per machine hour
- Weight output
- Length output

Development of *weighted comparison* criteria

Assist in *selection of primary measurement* alternative

Assist in *scope of primary measurement* alternative

- Operator
- Group
- Department
- Plant

Assist in *frequency of primary measurement* alternative

- Daily
- Weekly
- Monthly
- Yearly

Development of *secondary measurement* alternatives

- Rework
- Delivery
- Quality
- Scrap
- Attendance
- Medical incidences

Assist in *selection of secondary measurement* alternatives

Assist in *scope and frequency assignment of secondary measurement* alternatives

Assist in assignment of primary and secondary *relative weight* to one another

Development of *performance pay charts* based on historical indices

Written variable gain sharing incentive plan procedure

Liaison with payroll and data processing personnel

Assist with *implementation of variable gain sharing incentive plan*

**Interdynamics, Inc
80 39th Street
Brooklyn, NY 11232**

Enhancement of a Transporter/Paced work center/Progressive carousel system, installed by Gray Associated 20 year's prior, to address six new air compressor products. Time study and line rebalance of sub assembly motors, test, final assembly and packaging. Redistribution of work-in-process tote trays to a four-hour stage for thirteen paced work cells. Electrical controls to synchronize break period start/stop with all conveyors start/stop. Paced conveyors and photo-eye case stop replacement. All operations time balanced. Direct labor Enhancement savings 15 %. Initial D/L saving 45 %.

**Dorma Corporation
Main Street and Boose Road
Reamstown, Pa**

1) Systemized the assembly of hydraulic door closers from a push along, progressive line bench concept to a straight-line, continuous conveyor line. Used work center concept whereby presses, fixtures and semi-automatic machines were mounted on table tops and placed on a color coded, fifteen inch wide segmented conveyor to create controls and eliminate stacking between work stations. Tasks incorporated in line inspection, stamping, pins and bearing insertion, spring and pinion mounting, flushing and torque check. Consulting activity encompassed design of conveyor concept, time study and line balancing, reengineering and visual aids, supervisory training and group labor reporting. Direct of labor savings 33%. Work-in-process and space reduction 25%.

2) Warehouse pick and pack system. Development and integration of overhead paint line monorail, two live storage and retrieval order picking carousel conveyors with an indexing straight-line packaging conveyor. Three hundred and fifty hydraulic door closer packaging variations with components stored in sixty-eight, eight foot high bins using shelves to separate color combinations. Designed all equipment, determined concept, layout, time study and workstation time balance. In-house computer interface. Direct labor savings of 36%. Work-in-process reduction 50%. Space gain 60%.

**Warner Electric Company
Motion Control Division
1300 North State Street
Marengo, IL 60152**

Transformed entire bench method of assembling step motors into a conveyORIZED system. Interfaced Live Storage and Retrieval Carousels, supplying discreet components to department, with a thirty-one station Transporter conveyor responsible for the materials handling of all work-in-process. Transporter fed twenty-six, four station, conveyORIZED work centers where all direct labor is optimized using pacing techniques. Enabled a previous two-shift operation to double sales on a one-shift operation. Consulting activity included conceptual system design, equipment specifications, time study, layout, and implementation. Congested area changed to efficient, orderly department. Direct labor saving 50%. Work-in-process and space reduction 60%.