Lafayette Instrument®

Maintaining Industrial Competitiveness

Global Industrial Competition

One of the biggest challenges facing corporate America is how to compete or remain competitive in the global marketplace of the 21st century. Issues that govern achieving and maintaining a competitive advantage are also important elements of a company's strategic plan. These issues are:

- Employee Recruitment
- Employee Training
- Increased Productivity
- Reduced Turnover
- Improved Profitability
- Compliance with Government Regulations

In developing competitive strategies, many corporations understand that recruiting and keeping skilled and talented people are important to their long-term success. Therefore, the development and implementation of a valid selection system are important elements of any recruitment strategy. This is particularly important for companies where the jobs are in manufacturing or involve manual handling and where any risk of musculoskeletal injury is present.

According to the U.S. Bureau of Labor Statistics, job-related injuries in 1997 cost U.S. corporations over $45 billion. Strain/sprain injuries and musculoskeletal disorders account for a significant percentage of the reported workers' compensation costs. Some companies credit the ability to match a worker to an appropriate job, to sharp reductions of on-the-job injuries.

The objection to pre-employment or post-offer, pre-placement testing generates from the erroneous assumption that federal regulations prohibit such tests. While medical tests are illegal if given solely to make pre-employment decisions, conducting valid physical ability tests is legal. A valid test determines if the applicant or worker can perform the essential elements of a particular job. Such a test meets the legal standard of being a business necessity, and employers have a legal right to conduct such testing.

Employment Selection

A variety of factors, external and internal, influence a company's decision to implement employee selection and placement programs for physically demanding work tasks. These factors include but are not limited to:

- Federal and State Regulations
- Productivity
- Injury Reduction
- Workforce Moral and Employee Retention
- Marketplace Competitiveness
- Reduced Workers' Compensation Cost

An analysis of some of these factors and a review of how validated employment selection and placement programs helped several companies solve these problems appears on page 3.

Federal Regulations

Among the most far-reaching federal regulations yet published is the proposed OSHA Ergonomics Program Standard. It applies to all employers in general industry whose employees work in manufacturing or manual handling jobs or who report musculoskeletal disorders. It requires an employer to "fix" problem jobs quickly and completely. When the job cannot be modified, a more suitable alternative is to do a better job of matching the employee to the physical demands of the job/task. This approach was adopted by a golf equipment manufacturer, resulting in:

- A 46% reduction in OSHA recordables.
- A 85% reduction in repetitive motion claims.
- A 96% reduction in back injury claims.
- A 77% reduction in days away from work.

Injury Reduction

Avoiding injury is an important issue for safety and occupational medical personnel in most companies. For most workers, the risk of injury increases as the work approaches a worker's maximum physical work capacity. Workers least physically able to meet the demands of the job/task are those most likely to sustain back and other related injuries. After a company implemented validated employee selection and placement programs, it reported these results:

- A 25.3% decline in injuries within 7 major job classifications.
- A 17.3% decline in back injuries.
- A reduction in on-the-job injury rates from 12.5 to 1.5% of the workforce.

Increased Productivity

Studies show that workers who are required to perform physically demanding job/ tasks that approach their physical capacity work less efficiently and are injured far more frequently than workers whose physical abilities match the demands of the task. A validated employment and placement program can help identify workers who can comfortably perform the physically demanding jobs/tasks. Two companies adopted this approach, and recorded these results:

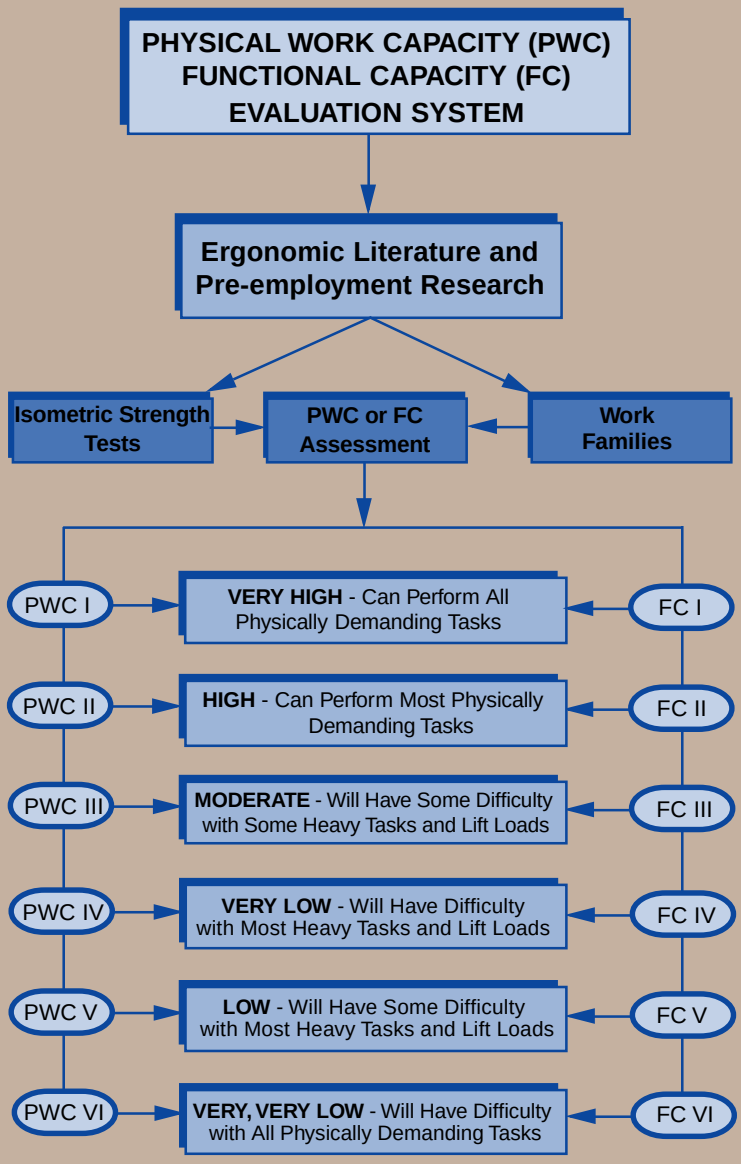
- Workers for a small package carrier who were among the tested population were able to unload 7 more cargo planes an hour than the nontested worker population.
- A leading construction company achieved a 50% reduction in workers' compensation costs and became the low cost provider of construction services among its competitors

Reduced Workers' Compensation Costs

U.S. Department of Labor data estimates that the costs of workers' compensation are over $45 billion, which makes a significant impact on corporate profits. To address this problem, a diversified manufacturing company implemented a validated employee selection and placement program and achieved the following results:

- The tested workers (59% of the workforce) accounted for 33% of all accidents at a cost of $44,121 (21.5% of total workers' compensation costs).
- The nontested workers (41% of the workforce) accounted for 67% of all accidents at a cost of $161,450 (78.5% of total workers' compensation costs).
- The company projected 1.5year savings of over $750,000 due to reduced accidents and strain/ sprain injuries.

PWC/FC



Scientific Foundation

Validation research is the linkage between test results and job tasks, making the system congruent with federal legislation, such as the Americans with Disabilities Act and the EEOC Uniform Guidelines.

Ergonomics literature and the University of Houston pre-employment research provide the scientific foundation of the PWC/FC Evaluation System, which consists of three major interrelated components:

General Work Families
The work families provide a model for categorizing physically demanding industrial work tasks.

Physical Capacity Tests
The physical capacity tests include isometric and fitness tests. The isometric tests provide a valid means for evaluating an individual's capacity to do the work tasks defined by the three general work families.

Computer-Generated PWC/FC Report
The physical capacity test and demographic data are used to generate a report that evaluates an individual's PWC or FC. Equations developed from pre-employment, exercise physiology and ergonomic research are used to generate the individual's PWC or FC report.

WORK FAMILY	DESCRIPTION	FAMILY MEMBERS
Materials Lifting	Tasks that require lifting objects to various heights at various rates.	1. Level III: Not Acceptable Lift Weight 2. Level II: Maximum Acceptable Lift Weight 3. Level I: Maximum Repetitive/Difficult Lift Weight
Maximum Force	Tasks that require a brief, maximal force effort for a short period of time.	1. Push/Pull Tasks 2. Breaking Tasks
Endurance Work	Tasks that require continuously enduring work for time periods of 15 minutes or longer.	1. Total Body Endurance Tasks 2. Upper Body Endurance Tasks

PWC/FC

Implementation

Implementation of the PWC/FC Evaluation System assumes that the physically demanding job tasks are well defined and that the job tasks can be categorized within the general work families previously described. In addition, job descriptions must be up to date.

Selection of Strength Tests

The PWC/FC Evaluation System offers 5 isometric strength tests:

- Grip Strength
- Arm Lift
- Shoulder Lift
- Torso Pull
- Leg Lift

These five tests have been found to measure the strength of the major muscle groups used to perform physically demanding work.

Instrumentation

The primary equipment used to perform a PWC Evaluation is the Jackson Strength Evaluation System (JSES). Developed by Dr. Andrew Jackson, the JSES was used in the development of validation research at the University of Houston during the last 20 years. In addition, the JSES has been adopted by companies in the telecommunications, small package carrier, transportation, manufacturing, construction, petrochemical and medical industries as the equipment of choice to perform physical ability testing. The advantages of the JSES are:

- Ease of Use
- Reliability
- Quick Administration Training Program
- Reproducible Data Output

Research-Validated System for Pre-Employment and Return-to-Work Testing

Dr. Andrew Jackson, F.A.C.S.M., Professor, Department of Health and Human Performance, University of Houston, Texas, developed the PWC/FC system. The Physical Work Capacity (PWC) and Functional Capacity (FC) Evaluation System evaluates an individual's capacity to perform physically demanding work tasks.

The PWC/FC Evaluation System input includes the individual's physical ability test results and demographic data. The output is a computer-generated report that assesses the individual's PWC or FC in relation to tasks defined by three work families. The report is designed to help employers make either of two employment decisions:

Pre-employment
The PWC report evaluates a job applicant's capacity to perform physically demanding work tasks.

Return to work (RTW)
The FC report not only evaluates an employee's capacity to perform physically demanding tasks at a level that allows for the safe return to work, but also evaluates the employee's general physical fitness.

Development of the PWC/FC system is founded on over 20 years of ergonomic research at the University of Houston, involving the validation of pre-employment tests and the defining of physiologically justified standards or "cut scores."

The PWC/FC Evaluation System uses isometric strength tests to define an individual's work capacity on a wide group of common,physically demanding industrial work tasks. The ergonomic principle is to match the worker to the demands of the job.

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Physical Work Capacity (PWC) and Funtional Capacity (FC) Evaluation System

About The Designer:

Dr. Andrew S. Jackson, F.A.C.S.M., is Professor of Health and Human Performance at the University of Houston and adjunct professor in the Department of Medicine, Baylor College of Medicine in Houston, Texas. He is a research consultant to the Cardio-pulmonary Laboratory at the NASA/Johnson Space Center (Houston), the Section of Cardiology at the Kelsey-Seybold Clinic in the Texas Medical Center (Houston), and the Division of Epidemiology at the Cooper Institute for Aerobics Research (Dallas). He is also a Fellow of the American College of Sports Medicine.

Dr. Jackson was awarded his doctoral degree in 1969 from Indiana University, Bloomington. Published extensively in the areas of exercise physiology, ergonomics and cardiology, he is the co-author of a measurement text in its 6th edition. Jackson as co-investigator, developed the Jackson-Pollock body composition prediction equations, which have become a world standard. He has been a principal investigator of numerous validation studies designed to select employees for physically demanding jobs in public safety, energy and materials handling industries. Jackson has developed valid employment tests for such leading companies as Shell Oil, Federal Express, Methodist Hospital (Houston), Union Carbide and Zapada Drilling.




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