



**Northwest Indiana
Fully Integrated
Steel Industry
Workforce Report
December 2003**



Prepared for:

**Center of Workforce Innovations and Lake County Integrated Services Delivery Board
Northwest Indiana Workforce Investment Boards**

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NORTHWEST INDIANA FULLY INTEGRATED STEEL INDUSTRY WORKFORCE REPORT

Steel Industry at the Crossroads

As you read the detailed report profiling the plight of the region's steel industry reflecting the dilemma of transformation in Northwest Indiana, you will realize the country's and especially Northwest Indiana is steel and manufacturing sector as a whole, is once more at the crossroads of change.

Approximately two years ago, Northwest Indiana's Workforce Investment Boards called a meeting of the regions fully integrated steel industry, USWA, and the Institute for Career and Development. The main issue was the aging skilled workforce and the potential for massive retirements, losing senior skilled workforce. At the conclusion of the meeting an agreement was reached to take positive action toward steel related dilemmas as the region's Steel Industry Cluster Alliance. The first step was to research the common needs of the region's steel industry through a questionnaire and on-site visit. The results, through a great deal of communications and hard work, are outlined in this report.

Next steps will include changing the image of the region's steel industry, providing future opportunities for students and adults, increasing job skills for entry-level workers through educational involvement, continuing to educate existing workers for job advancement, and improving the linkage system between employers to the potential workers.

The steel industry and other manufacturing sectors continue to be the bedrock of the nation with over 21 percent of the Gross National Product (GNP) and one of the highest "multiplier" effects in terms of job creation. This means for every \$1 million in final sales from manufactured products, that amount supports eight jobs in the manufacturing sector and an additional six jobs in other sectors such as services, construction, and agriculture. In total, manufacturing jobs support nine million jobs in other sectors.

The region's steel industry has both inadequate and antiquated equipment plus the most modern manufacturing equipment, machinery, processes, and technology the world has to offer. When older equipment and machinery are modernized, they are replaced with prevailing, cutting-edge technology, advanced manufacturing equipment and processes, and modern machinery.

To manage the workforce and operate and maintain equipment and machinery, the region's steel industry and manufacturing as a whole are employing professionals and skilled workers in every specialty imaginable. Some of these specialties are highly qualified, multi-task production workers, multi-skilled craft workers, extremely skillful and versatile operating and maintenance managers, staff professionals such as quality, metallurgical, electrical, industrial, environmental, and chemical engineers and technicians, and other supporting staff.

Responsible manufacturers such as the steel industry offer a multitude of exciting, varied, and well-compensated careers, as

well as medical and health benefits, pensions, and opportunities for self-fulfillment and career advancement. The manufacturing worker compensation averages 20 percent higher than comparative averages for all U.S. workers.

To this end, the National Association of Manufacturers (NAM) has committed to "make manufacturing careers a preferred career option by the end of this decade" through intergraded awareness, career planning, and a public education campaign. NAM will energetically advocate for education, training, taxation, regulation, trade, and monetary policies that will enable manufacturing to maintain its position at the core of a productive U.S. economy.

More than 80 percent of large and small manufacturers researched in the report titled *The Skills Gap 2001*, a "moderate to serious" shortage of qualified job applicants was identified. The most critical shortages of employees identified were in production and the direct support of production including engineering and skilled crafts. Other transferable skill shortages include, but are not limited to, technical and vocational skills, basic employable skills, applied math, reading, oral and written communication, and character traits such as listening, initiative, adaptability, problem solving skills, and team building.

Managers, professionals, and skilled production and craft occupations are currently high in demand but short in supplies. The steel industry and other manufacturers project employees will be retiring in large numbers in the next 1-3 years and the steel industry is facing a potential mammoth talent crunch. Demographers suggest there will not be enough qualified candidates in the next generation to pick up the slack in manufacturing employment opportunities. Therefore, with 76 million baby-boomers heading toward retirement over the next two decades and 46 million 'Gen Xers' waiting in the wings, there may be a shortage of 4 to 6 million manufacturing sector workers.

What does this mean to the region's steel and manufacturing workforce? The Northwest Indiana Integrated Steel Cluster member's mission is to address the serious steel and steel related manufacturing skill shortages. Launching the steel report identifies common external and internal challenges, future critical occupational needs, hiring patterns, recruitment methods, education and training opportunities, and possibilities for corrective action. In the near future, objectives and action plans/steps with measurable outcomes will be completed.

The Steel Cluster Alliance will include a "supplement" to this report at the end of 2004 identifying changing workforce needs.

Source:

Keeping America Competitive: How Talent Shortage Threatens U.S. Manufacturing. A White Paper, From the National Association of Manufacturers, The Manufacturing Institute, and Deloitte & Touché

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Purpose of the Report

The steel industry in Northwest Indiana faces enormous workforce challenges and opportunities during the next several years. This report offers a look at what those challenges and opportunities are for an industry that is a key part of the region's economy.

This report builds on the Northwest Indiana Workforce Profile, published by the Center of Workforce Innovation's (CWI's) Workforce Investment Board. That profile of the region's workforce provided a factual foundation for a strategic planning process. Community leaders used the baseline data to develop goals for the region. Over the next several months, taskforces comprised of stakeholders from across the seven-county area established measurable objectives around each goal and agreed upon tactics and responsibilities for meeting those goals. Their efforts culminated in a major workforce summit held in November of 2002 to publicly share their strategies and demonstrate commitment to the work ahead.



The Northwest Indiana Workforce Profile identified the steel industry as both a source of strength for the region as well as a potential vulnerability. Steel plays a tremendous role in the area's economy. Because it has such a large impact, the region is vulnerable to downturns in the industry. In fact, "Diversify the Economy" was established as a major goal to lessen the area's dependence on one industry. However, there is no denying that steel is, and will continue to be, a critical component of the regional economy. To that end, policy-makers and workforce intermediaries need to better understand the industry's labor needs. The information contained in this report is intended to help the community and the steel industry to work collaboratively to shape strategies supportive of their mutual success.

Data Sources and Definitions

Sources

Data	Source
Current events in the industry	<ul style="list-style-type: none"> • Indiana Business Magazine: Northwest Indiana Update, www.indianabusiness.com, 12/16/02 • Steel: Its Impact on Our Local Economy; the Midwest Steel-Framing Alliance, www.mwsteelframingalliance.org, 12/16/02 • Angles: News, Data, and Analysis about the Steel Industry, World Steel Dynamics, www.worldsteeldynamics.com, 12/16/02
Industry Employment trends, projections, earnings, and hours worked	Indiana Department of Workforce Development
Unionization percentages across industries	U.S. Bureau of Labor Statistics
Occupations in the Steel Industry	<ul style="list-style-type: none"> • Interviews with United Steel Workers of America (USWA), Midwest Steel, United States Steel (USS), Bethlehem Steel, and Ispat Inland, Inc. • Job Description and Classification Manual for Hourly Rated Production, Maintenance and Non-Confidential Clerical Jobs (1971), USWA-AFL-CIO·CLC and Coordinating Committee Steel Companies • Prairie State College's apprenticeship and craft training programs
Industry Challenges, Skills Challenges, Hiring Patterns, Recruitment Methods, Certifications and Assessments, Education and Training. Future Workforce preparations.	Interviews conducted in the late fall of 2002 with representatives from Midwest Steel, USWA, USS, Bethlehem Steel, and Ispat Inland, Inc.
Hiring Patterns	Development Dimensions International (DDI), work place essential skills; resource related to the Secretary's Commission on Achieving Necessary Skills (SCANS) Competencies and Foundations Skills
Twentieth Century Fund Task Force on Retraining America's Workforce (No One Left Behind, 1996, p.37)	Institute of Career Development (ICD)

Definitions

“Manufacturing” includes all types of manufacturing, such as food products, textiles, garments, logging, beverages production, books, asphalt, plastics, tires, concrete, electronic equipment, computer equipment, furniture, surgical supplies, jewelry, transportation equipment, etc. It is essentially any establishment engaged in the mechanical or chemical transformation of materials and substances into new products.

“Durable goods” includes motor vehicles, furniture, construction materials, metals, and other items that have a normal life expectancy exceeding three years.

“Non-durable goods” are items with a normal life expectancy of less than three years, such as drugs, chemicals, textile products, groceries, beverages, books, tobacco products etc.

“Primary metals” North American Industry Classification System (NAICS) 331 includes Steel Works, Blast Furnaces, and Rolling and Finishing Mills, Iron and Steel Foundries, Primary Smelting and Refining of Nonferrous Metals, Secondary Smelting and Refining of Nonferrous Metals, Rolling, Drawing, and Extruding of Nonferrous Metals, Nonferrous Foundries and Miscellaneous Primary Metal Products.

“Industrial machinery and equipment” NAICS 333 includes establishments engaged in manufacturing industrial and commercial machinery and equipment such as engines, cranes, monorails, farm machinery, etc.

“Chemicals and allied products” NAICS 325 includes drugs, soaps, paints, agricultural chemicals, and so forth.

“Average weekly hours, Average weekly earnings and Average hourly earnings” for technical definitions of how these data elements are developed, contact the Indiana Department of Workforce Development. It should be kept in mind when viewing averages that, for example, an “average” annual income of \$55,000 per year does not mean each individual in the industry earns that much. It could mean that half the individuals earn \$25,000 per year, and the other half earn \$85,000 per year, while no one makes exactly \$55,000. Total hours during the pay period include all hours worked (including overtime hours) and hours paid for holidays, vacations, and sick leave. Total hours differ from the concept of scheduled hours worked. The average weekly hours reflects effects of numerous factors such as unpaid absenteeism, labor turnover, part-time work, strikes, and fluctuations in work schedules for economic reasons. Overtime hours in manufacturing are collected where overtime premiums were paid if hours were in excess of the number of straight time hours in a workday or workweek.

Executive Summary

Northwest Indiana has long been synonymous with steel. The steel industry not only employs a significant percentage of the workforce, but it pays some of the highest wages in the region and contributes significantly to the economy. The workforce impacts all communities in Northwest Indiana. Employees live throughout these counties, with an effect on local commerce, schools, and taxes, etc.

The number of steel workers has been steadily declining over the last two decades, mostly due to better technology and manufacturing processes, imports, competition, and consolidations. Fewer workers are needed to produce more, and higher quality steel. Employees need increased job skills to be successful in this environment. The industry offers both great opportunities and challenges for Northwest Indiana as it faces a catch-22 situation. On the one hand, many new qualified job candidates will be needed over the next five years as the industry's aging workforce reaches retirement age. However, the current economic downturn has resulted in layoffs, bankruptcies, decreased training, and uncertainty. Coupled with a historic image of steel as dirty manual work, how can the industry attract the caliber of workers it needs to stay competitive?

Interviews with steel representatives revealed many shared problems, including:

- External factors, such as technology changes, an aging workforce, image, and the economy.



- Internal factors, such as skill deficits, reduced training budgets, high failure rates of applicants in screening processes, and common hard-to-fill positions.

Most representatives report satisfaction with the recruitment services they receive from WorkOne Centers despite the low skill levels of most applicants. They recruit primarily from Northwest Indiana, despite dissatisfaction with the ability of local secondary and postsecondary schools to prepare students for careers in steel.

Clearly, there is more room for collaboration between the steel industry and the Workforce Investment Boards (WIBs) of Northwest Indiana to address shared concerns, yet most industries appear unaware of the WIBs' role in workforce and economic development. This report may improve the dialogue among the steel industry and the community leaders to support joint goals that will assist in the continued viability of the steel industry as a major contributor to the economy of Northwest Indiana.

Industry Challenges

Northwest Indiana steel representatives who were interviewed cited many external forces that are impacting the industry. These include new technology, an aging workforce approaching retirement, the historical image of the industry, global, and domestic, and regional economic conditions.

➤ New Technology

- ◆ There have been changes in systems, computerization, processing, and quality standards. New technologies have affected the way the company does business from order entry to order exit. Computer technology has not only changed the way companies do business with external customers and suppliers but with internal customers as well.
- ◆ All operating, maintenance, production planning, purchasing, information systems, and so forth are highly computerized and process controlled.
- ◆ The proliferation of programmable control systems and electronic equipment replacing mechanical/hydraulic equipment has led to an increased need for electronically skilled employees.

➤ Age and Retirement

- ◆ A large number of employees will be able to retire in the next 5-10 years. The loss of both highly skilled production and



maintenance personnel will be mainly due to retirement.

➤ Industry Image

- ◆ The image of the steel industry is historically poor and the current economic situation makes it difficult to recruit skilled applicants, particularly for mills affected by Chapter 11 bankruptcy.

➤ Economic Conditions

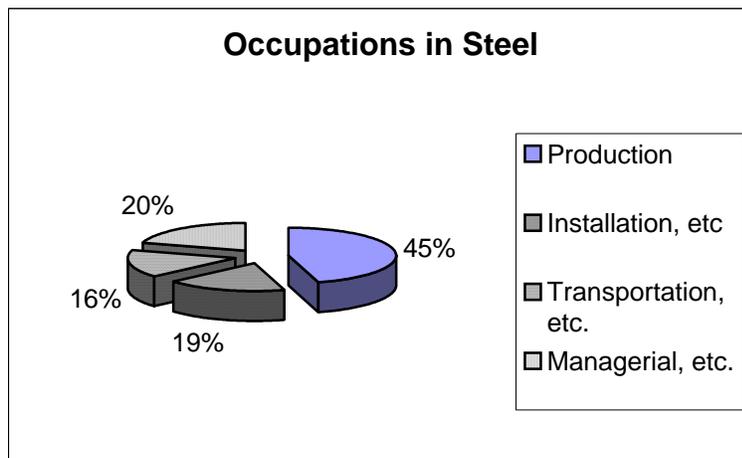
- ◆ Economic conditions include import dumping.
- ◆ Steel producers must keep pace with external pressure demands internationally, domestically, and regionally with challenges in competition, costs, services, and pricing.

➤ Consolidations

- ◆ US Steel purchase of National Steel.
- ◆ International Steel Group (ISG) purchased Bethlehem Steel Corporation.
- ◆ PBGC pension takeovers of Bethlehem and National Steel.
- ◆ The loss or termination of pension benefits.

“Future Needs” Occupations in the Steel Industry

There are a variety of occupations in the steel industry, primarily in production (45%), but also in Installation/Maintenance/Repair/Construction (19%), Transportation and Material-Moving (16%) and Managerial/Professional/Sales/ Administrative Support (20%).



Over the years, jobs in the industry have been added, changed, expanded, combined, or eliminated. Understanding the variety of opportunities and the skills required for each are important for educators, job seekers, and workforce policy-makers in the region.

Source: Bureau of Labor Statistics

Bargaining-Unit Occupations in the Steel Industry

Most job openings are filled (awarded) in accordance with provisions within the Basic Labor Agreement between the steel company and the United Steelworkers of America. Most job openings beyond entry-level are awarded internally. However, when a job opening is not filled internally, it may be filled externally in accordance with the company's recruitment practices and procedures.

The following list of occupations and their descriptors reflect several but not all potential job openings that may continue

to require external recruitment. Although each occupation has its own intricacies and specialties, there are occupations that have common knowledge, skills, and common tasks associated with them. For this reason those occupations are grouped together.

Laborer, janitor, and other production entry-level jobs: Although manual labor is necessary, the laborer is expected to gain skills needed to move up into more difficult and complex technical production, services, and maintenance positions. The positions require good work ethics, and transferable work readiness knowledge and skills.

Electronic technician, multi-electrician, electrician, and electronic repairman:

These positions require expert knowledge and skills in electronics and industrial electricity. Some of the necessary skills are AC/DC and industrial electricity and electronic blueprint reading, analysis, troubleshooting, maintaining, and repairing electrical/electronic control and power circuit components; and using various instruments such as, but not limited to: volt-ohm meters, oscilloscopes, and amp probes.

Control systems technician, combustion technician, systems/ electronics, process automation technician:

These positions require expertise in instrumentation process analysis, logic control, computer control devices, process control, measuring, and calibrating while troubleshooting, maintaining, and repairing instruments and communication devices and related equipment.

Mechanical technician, multi-mechanic:

These positions require expertise and skills in mechanical knowledge, troubleshooting, maintaining, and repairing a variety of industrial machinery and equipment. Areas of expertise include, but not limited to: mechanical blueprint reading, power train (gears, couplings, bearing, drives, etc.), rigging, lubrication, tools, pipefitting, hydraulics, pneumatics, burning, and welding.

Motor inspector, motor inspector expanded:

Workers in these positions troubleshoot, maintain, and repair motors using electrical blueprints and electrical testing instruments, industrial electrical (AC and DC) control and power circuit

components, relating to but, not limited to: motors, generation, transformers, hydraulics, control and switching devices and sensors, cranes, equipment and machines. "Expanded" refers to the skills and tasks in oxy-acetylene burning, and arc welding - flat, horizontal, vertical, and overhead.

Millwright, millwright expanded:

Millwrights troubleshoot, maintain, and repair mechanical equipment and machines. They attend to mechanical problems relating to, but not limited to: gears, bearings, pulleys, shafts, brakes, wheels, alignment, burning, lubrication, and hydraulics. "Expanded" refers to the skill in oxy-acetylene burning, and electric arc welding - flat, horizontal, vertical, and overhead.

Team Technician: A team technician is in an electrical or mechanical craft position with the added responsibility of a team leader. Added responsibilities include but are not limited to: leadership skills; ability to lead a team effectively; problem solving skills; self-starter; accepts changes and dynamics of an organization; works effectively with members of the union and supervision; manages diversity; high values and ethics; improving quality standards in product, services, and people, decision-maker, and set priorities well.

Electrician (Line Worker):

The Line Worker installs, troubleshoots, maintains, and repairs high voltage/ high amperage power transmission lines (overhead, underground, through raceways, etc.), transformers, switchgears, and other related equipment. Blueprint reading, the use of hand tools, and manual and hydraulic benders are essential.

Electrician (Wirer): The Wirer works from electrical diagrams and other related blueprints, installs conduit and fittings for all types of electrical equipment, new, replacement, or up-grade. Workers in these positions troubleshoot equipment for proper operations and work with hand and power tools.

Heating, Ventilation, and Air Conditioning (HVAC): Workers in these positions troubleshoot, maintain, repair, and install all mechanical and electrical components and equipment relating to heating, refrigeration, ventilation, and air conditioning units and their applications. Universal Type Licensing is required. Expertise is required in, but not limited to: compressors, condensers, evaporators and metering devices, gas combustion, venting, control and power circuit problems, pressure systems, and temperature control.

Pipefitter: The pipefitter troubleshoots, maintains, lays out, installs, and repairs low-pressure and high-pressure pipelines, tubing, fittings, valves, drainage flow and systems, vent, traps and waste pipes, steam systems and other related components. He/she sets up and operates various power tools for cut-offs, bending, and threading. The use of hand tools, testing equipment, burning and welding equipment are necessary. Knowledge and skills in pipe layout, calculations, and blueprint reading are critical.

Welder: Welders perform, at a minimum, metal-inert-gas (MIG) welding, tungsten-inert-gas (TIG) welding, oxy-acetylene welding, automatic welding, brazing, soldering, and cutting although most fusing of metal occurs in the form of

electric-arc welding, and cutting by means of oxy-acetylene burning. Many positions and welds such as flat, horizontal, vertical, overhead, structural and pressure vessel are common processes.

Machinist: The machinist sets up and operates machine tools and equipment, interprets drawings; plans and determines layout and work procedures from complex blueprints; lays out and sets up work to drill, face, cut, turn, bore, shape, and mill parts to precision tolerances; and specific finishes. He/she checks and measures work with micrometers, calipers, and other precision tools and operates drill presses, lathes, mills, saws, and grinders. Some operations may include computerized computing processes such as computer numerical control (CNC) machines and programming and computer aided design (CAD).

Mobile Equipment Mechanic: These workers troubleshoot, inspect, adjust, repair and rebuild gasoline, diesel, and electric powered equipment and industrial transportation vehicles. They repair engines, hydraulic and electric systems, carburetors, injectors, air compressors, transmissions, brake systems, suspension system, wheel balance, clutch assemblies, steering systems, ignition systems, lights and wiring and other components related to mobile equipment. Mobile equipment mechanics utilize blueprints; hand and power tools; precision and testing tools; and refer to equipment catalogues to determine sources and causes of trouble, while complying with government standards, regulations, and policies.

Sheet Metal Worker: Sheet metal workers fabricate, install, and repair sheet metal items such as air and heat ducts, ventilators, siding, and roofing. They use blueprints, patterns, and templates to lay out work. The position requires analyzing and planning complex layout, development, and fabrication involved in performing a variety of sheet metal fabrication and installation work. Workers use traditional and precision tools and equipment.

Boilermaker: Boilermakers lay out, fabricate, assemble, erect, and make repairs for all types of structural and plate work. They operate equipment for bending, shearing, pressing, grinding, riveting, fitting, burning and welding and perform hydrostatic or pneumatic tests for structural and pressure compliances. They use tools of the trade, blueprints, shop formulas, and geometry to locate lines, centers, angles, and bends.

Mason: The mason performs, repairs, and installs various types of refractory; insulating material, brick, blocks, concrete, mortar, and other masonry materials used for furnaces, buildings, walls, and foundations applications. Masons plan, calculate, and lay out work and materials. They use hand and power tools of the trade such as masonry cutting saws, levels, trowels, plumb bob, strikers, chisels, hatchets, rakes, tapes, straightedges, hammers, and squares.

Salaried Occupations In The Steel Industry

Shift Manager or Operating Manager: This position requires expertise in production and/or maintenance duties

and responsibilities. Managers must have the ability to communicate directly and indirectly, and in written, oral, and visual formats at all levels of the organization. They must have the capability to problem solve, make effective decisions, and work as a team leader or a team member, set priorities, and manage time. Managers are change agents who understand the dynamics of an organization, the art of motivating and training people, listening, and handling adverse people and situations effectively. Managers in these positions must be able to plan, organize, direct, control and analyze work through high performance strategies, quality improvement methods and critical path analysis. They place emphasis on training needs and understand and implement safety, health, and environmental practices, standards, regulations, and policies. Managers understand the relationship between inventory control, production control, receiving and stores, material handling, distribution, transportation, and purchasing of material and supplies. Additionally, they must understand and be proficient in computer applications.

Metallurgical Engineer: Metallurgical engineers have the ability to communicate directly and indirectly, and in written, oral, and visual formats at all levels of the organization. They require the capability to problem solve, make effective decisions, and work as a team leader or a team member and, set priorities, and manage time. The engineers are change agents who understand the dynamics of an organization, the art of motivating and training people, listening, and handling adverse people and situations effectively. Workers in these positions study

corrosion mechanisms within industrial metals and alloys and their electrochemical, physical and mechanical properties. The ability to select appropriate metals, alloys, nonmetallic materials, linings and coatings for specific applications is integral to solving many corrosion-related problems and failures. Such material selection for chemical processes and new design applications has long-term ramifications in both the industry's economic longevity and safety considerations.

Technical Engineer: The technical engineer has the ability to communicate directly and indirectly and in written, oral, and visual formats at all levels of the organization. He or she must have the capability to problem solve, make effective decisions, and work as a team leader or a team member as well as, set priorities, manage time and act as a change agent. The technical engineer understands the dynamics of an organization, the art of motivating and training people, listening, and handling adverse people and situations effectively. Workers in these positions must understand technical definitions and the documentation of structural test requirements including specimen details, load and load introduction requirements, instrumentation requirements, inspection requirements, reporting process and rig design requirements. Competence in the use of MS Office, MS Project and Risk/Requirements Management and establishment of agreed test time plans is required. He or she must be a highly experienced metallurgy expert with practical experience in the areas of metal failure analysis, heat treatment, microstructure, mechanical properties,

micro hardness, corrosion control, processing technology, product development and component failure analysis, as well as a specialist in Quality Control/ISO/Assurance programs and manuals.

Chemist: Chemists have the ability to communicate directly and indirectly and in written, oral, and visual formats at all levels of the organization. They have the capability to problem solve, make effective decisions, and work as a team leader or a team member as well as, set priorities, manage time, and act as a change agent. Chemists understand the dynamics of an organization, the art of motivating and training people, listening, and handling adverse people and situations effectively. They provide technical support and management for the chemical lab and ensure laboratory methods are consistent; maintain laboratory equipment; determine analytical uncertainty and method detection limits; establish performance standards for lab equipment; audit procedures; supervise lab personnel; direct proficiency testing programs for laboratory accuracy; modify laboratory methods as allowed; lead problem solving efforts; oversee lab supply procurement and inventory; and maintain laboratory accreditation.

Clerical: Workers in these positions must be proficient in office skills and business software such as word processing, spreadsheets, and data base applications, email, and Internet search. He or she must be skilled in written and oral communication techniques, and procedures relating to office management, office organization, filing, proof reading,

typing forms, correspondence, and communication by phone.

As the industry becomes more technologically sophisticated, there is a growing need for computer specialists, engineers, and engineering technicians. While many jobs only require a high school diploma, demand is increasing for postsecondary, technical and trade school graduates. Production workers typically receive on-the-job training, with an expectation that they will specialize in a particular process and advance to skilled positions. Workers must learn to operate computers to keep up with technological changes in the industry.

Declining employment in the industry over the next few years will only partly be due to foreign trade, environmental regulations, and the overall economy. The primary cause of decline is expected to be labor saving technologies and machinery. Computers have become essential. They have changed the nature of some jobs while eliminating or reducing the demand for others. But operating computers demands a higher level of skill than has traditionally been required by the industry. Increased automation will create a demand for fewer- but better educated and trained - workers.

Nationally, just over 40% of iron and steel workers were unionized in 2000, far surpassing the 16.2% national rate in durable goods manufacturing and 14.9% rate in all industries, according to the Bureau of Labor Statistics. Given this high rate of participation, it becomes increasingly important for unions and management to work together to face the challenges to this critical industry.

Skill Challenges

New technology in the steel industry has resulted in a technology skills gap in the workplace. Failure rates on testing are very high. The multiple technical skills required for craft positions are a shared problem across the industry, as workers must understand more than one type of technology application.

The major steel producers share many of the same “soft” skill problems for both the current workforce and new job applicants. “Soft skills” and work ethics are major issues among all age groups.

Solid basic skills are expected of all employees because they must continue to learn throughout their work lives. The industry needs them to be able to move up into more difficult positions and to be flexible enough to change work tasks as the needs of the industry change.

➤ Technical Skills

- ◆ Companies continue to experience serious problems filling job openings with qualified applicants who have the necessary technical skills.
- ◆ The need to know electrical and mechanical applications is extremely critical and difficult to find when hiring for a shift manager position.
- ◆ Understanding of programmable logic control systems coupled with combustion process control is required due to technological changes in the steel making process. Rates of failure on written and practical tests are very high.



- ◆ A very high percentage (11 of 12 craft candidates at one firm) fails craft-entry level testing. Another company reports very low pass rates for Motor Inspector (39%); Systems/Electronic Craft (41%); and for Millwrights (53%).
 - ◆ Multi-skilled occupations are extremely difficult to hire or train for. Craft applicants must understand programmable logic control systems, combustion process control, instrumentation, digital logic, integrated digital circuits, microprocessors, drive and power systems, hydraulics, fluid control and power systems, power transmission, rigging, welding, etc. Rates of failure on the written and practical tests are very high.
- ### ➤ Soft Skills
- ◆ There are deficiencies in work ethics and personal qualities such as positive attitude toward work, attendance, following orders, exhibiting self-management practices, etc. Many job seekers and some existing workers demonstrate lack of initiative,

motivation, responsibility, communications, and planning ability.

- ◆ Many candidates for shift manager and some existing shift managers have little people and leadership skills such as organizational change, coaching, encouraging, adapting, understanding, and empathy. Salary level positions require leadership qualities including creating synergy, listening effectively, self-management, time management, accepting change, targeting and influencing improvement opportunities, building trust, and personal empowerment.
- ◆ The companies experience problems finding qualified applicants with basic work readiness skills.

➤ **Basic Skills**

- ◆ The ability to absorb training is extremely important. Firms expect entry-level workers to have the mental capability and skills to move up into production and craft occupations.
- ◆ Laborers are expected to have the capability to perform numerous mental and practical tasks on the job; in other words, the mental capability and skills to move from one job to another.
- ◆ The vast majority (91%) fails job-entry level testing at one mill and (95%) fail the basic job-entry level test at another. At a third company, the failure rate for all job-entry level including craft, etc. applicants is (29%). Most job-seeking candidates lack basic shop math, measurements, fractions and converting skills.

Hiring Patterns

Future hiring patterns will be consistent and significant with hiring standards for essential positions. Low skilled (entry level positions) are the least critical in the industry, but steel producers still anticipate hiring some of them in the next 5 years due primarily to retirements and workers lost to layoffs and other turnover.

The most critical positions are also the hardest to fill because they require the most skills.

Behavioral dimensions that are necessary for all positions are not of the type typically taught, assessed, and mastered in school. Traits such as work standards (ethics), initiative, teamwork, and leadership are learned at home as much, if not more, as they are in the classroom.

➤ Least Critical Positions

- ◆ General laborer including janitorial, groundskeepers and other non-essential production labor

➤ Most Critical Positions

- ◆ Craft Positions:
 - Team Technician
 - Electronic Technician
 - Mechanical Technician
 - Process Automation
 - Electrician
 - Machinist
- ◆ Shift Manager
- ◆ Research Scientists, Technical Engineers, and Operating Managers



- ◆ Electronic Combustion Technician
- ◆ Metallurgical Engineers

➤ Hardest to Fill Positions

- ◆ Most Crafts
- ◆ Control System Technician, Combustion Technician, Multi-Electrical, Multi-Mechanical, and Shift Manager
- ◆ Engineers
- ◆ Metallurgical Engineers

➤ Openings in Next Five Years

- ◆ Virtually all levels of hourly and salaried jobs: laborer, production, maintenance, shift manager, service staff, etc., due to the enormous number of employees who will be eligible to retire.
- ◆ Skilled crafts, including but not limited to: electrician, line worker, motor inspector, expanded motor inspector, systems/electronics, mobile equipment mechanic, HVAC, mason, millwright, expanded millwright, sheet metal, machinist, pipefitter, welder, boilermaker, and iron workers.

➤ **Priority Traits Necessary for Hiring Bargaining Unit Workers**

◆ **Work Standards**

- Setting goals for oneself.
- Strives for above average performance.
- Showing concern for oneself and the organization in quality, details, accuracy, and performance.
- Exhibiting good attendance, punctuality, and work attitudes.
- Accepts responsibility.
- Applies employee rules, regulations, and policies in the workplace.
- Accepts and manages change.

◆ **Communication skills**

- Effectively expressing ideas in individual or group settings.
- Reads well and uses writing, grammar, and vocabulary correctly in both written and verbal communications.

◆ **Initiative**

- Self-starter who proactively asserts his/her own actions within boundaries without being closely supervised.
- Willing to accept responsibility and challenges.

◆ **Ability to work on a team**

- Able to work with others effectively in a team effort accomplishing team tasks and assignments.

- Recognizes the efforts, talents, skills, and wisdom of team members and how they may want to contribute to the process.

◆ **Problem solving skills/Decision Making**

- Ability to effectively listen, consider decisions of others.
- Problem identification and drawing conclusions from data collected.
- Understands the impact of actions and outcomes.
- Solve problems based on correct problem solving steps and recommendations based on fact-finding, logical thinking, and overall impact of decision.

◆ **Leadership Skills**

- Inspires, influences, and motivates others' work habits and work practices.
- Takes responsibility for one's actions and results.
- Suggests workplace improvements.
- Interacts well with others.
- Initiates and manages change.
- Understands the diversity of opinions with individuals and groups.

◆ **Ability to Learn**

- Ability to gain knowledge and skills and put them to practice.
- Ability to transfer and adapt the knowledge and skills gained to other promotable jobs.

- ◆ **Safety Awareness**
 - Aware of the conditions and environment that affect employee safety.

➤ **Priority Traits Necessary for Hiring Salaried Employees**

- ◆ **Results orientation:** Point of reference and direction of choice and outcome based on decisions and conclusions to meet the bottom line and return on investments in the future.
- ◆ **Communication:** Expressing ideas effectively in individual or group settings. Reads well and uses writing, grammar, and vocabulary correctly in both written and oral communication.
- ◆ **Priority setting and time management:** Selects tasks and goals, ranks their importance, allocates time to and across tasks, prepares and follows schedules.
- ◆ **Problem solving:** Identifies problems, listens effectively, considers decisions of others, develops solutions with action steps, reviews the return on investment, tests the solutions, makes recommendations, implements the solution, solicits feedback on results.
- ◆ **Perseverance:** Attitude and determination to continue in the face of obstacles on the job.
- ◆ **Decision-making:** Problem identification, drawing conclusions from data collected, problem solutions, recommendations,

actions taken, and understanding impact of actions and outcomes.

- ◆ **Process management:** Defines responsibilities and decision points prior to running the job, during the time the job is being run, and after the job is completed.
- ◆ **Ethics and values:** Complying with the organization ethical and conduct policies.
- ◆ **Integrity and trust:** Can be trusted, beliefs and behavior are within the ethical codes of the organization.
- ◆ **Managing diversity:** Understanding differences in culture, opinion, skills, and work groups.
- ◆ **Total quality management:** Setting standards of performance for self, others, and the organization.

Recruitment Methods

WorkOne Centers are a major source of job candidates for the steel industries. Since the firms mostly recruit from within Northwest Indiana, having a local workforce supplier with whom they can develop a long-term relationship is beneficial. However, two firms regularly use Internet job boards to recruit from outside the state, particularly for higher-level technical positions and management.

Current Recruitment Methods

- WorkOne Centers
- Company-wide employee referral system
- Career Fairs
- Job Fairs
- Newspapers
- Colleges
- On-line
- Minority recruiters
- Recruiting firms
- Other employers

Satisfaction with Recruitment Methods

- Two companies report an excellent working relationship with WorkOne Centers, although CS3 doesn't perform to their expectations. They find the best sources for bargaining unit job openings are the WorkOnes, employee referrals, job fairs, newspapers, and the Internet job boards. At the same time the best salaried recruitment tools



are internet job boards, professional services, and the regional postsecondary schools.

- Other firms feel some of the best sources for bargaining unit hiring are through the national internet job boards. At the same time some of the best salaried recruitment tools are the national internet job boards, professional services, and the regional postsecondary schools that enable them to reach a wide variety of candidates with varying skills and experiences.

Scope of Recruitment

- Most recruitment is done in Northwest Indiana.
- The Internet is used to reach out to other parts of the region, state, and nation.
- Many high technical/engineering (electronic-electrical, mechanical, etc.) are routinely recruited outside Northwest Indiana, and typically outside the state of Indiana. One firm indicated that the postsecondary educational institutions in the region are not the top recruitment sources for these positions.

Certifications and Assessments

Despite the fact that employers have found skill deficits in the majority of applicants, entry-level positions require no skill certification of any kind. A high school or college diploma is no guarantee of skills, as the firms have to conduct their own assessments in addition to diploma requirements.

The major steel producers assess for many of the same basic work readiness

skills. A common, transferable tool that could be administered at the secondary level would help schools understand if they are developing the types and levels of skills required by industry, and would save industry the expense of re-assessing applicants with diplomas.



Job Position	Certification Required
Job entry position; Labor, etc.	None, or high school diploma or equivalent
Truck driver	Certificate and license
Salaried positions	Degree and experience
Research engineers, steel sales and other staff functions	Certificate or degree
Security and Fire	HAZMAT and EMT certifications

Assessment Tool and Job Position	Skills Assessed
Basic Work Readiness Skills for all job-entry applicants	<p>Math component:</p> <ul style="list-style-type: none"> • Adding, subtracting, dividing, multiplication and of whole numbers, fractions, and decimals • Use of tables, graphs • Finding "X" • Calculating Circumference, diameter, and radius <p>Reading Comprehension:</p> <ul style="list-style-type: none"> • Reading passages and answering questions about passages. <p>Inspection and Measurement</p> <ul style="list-style-type: none"> • Ability to measure and inspect various components similar to bolts, gages, objects, charts • Number checking; ability to scan and find correct numbers from lists of data

Reading and Math tests for all entry-level positions	Assess for 12 th grade reading and math levels.
Bennet Mechanical Comprehension Test for entry level workers	Examines knowledge in mechanical understanding such as: <ul style="list-style-type: none"> • Gear rotation • V-belt drives • Pulleys • Chain drives • Other applications
Bennet Mathematical and Vocabulary Tests for entry level workers	<p>Math:</p> <ul style="list-style-type: none"> • Eighth/ninth grade level • Calculations in addition, subtraction, multiplication, and division of whole numbers, fractions, decimals, and mixed numbers. <p>Vocabulary:</p> <ul style="list-style-type: none"> • Eighth/ninth grade level • Understanding and meaning of words
Written and practical craft-related tests for craft candidates	Including, but not limited to assessment of knowledge of: <ul style="list-style-type: none"> • Power transmissions • Rigging • Pipefitting • Hydraulics • Fluid control and power systems • Welding • Mechanical Print Reading • Pneumatics • Tool identification • Hand and power tools • Motors • Control and power circuits • Electronics and electrical print reading • Test instruments • Power distribution • Troubleshooting • Programmable logic controllers • Integrated digital circuits • Microprocessors • Generators • Combustion process control systems • Instrumentation

Clerical Tests for clerical positions	Basic typing and keyboard accuracy and speed and basic computer skills such as Word and Excel.
Targeted Selection Interview	Behavioral dimensions and motivations associated with success or failure in a job: <ul style="list-style-type: none"> • Work standards and quality orientation • Communication • Initiative • Teamwork and Collaboration • Decision-making and Safety awareness • Ability to learn, leadership skills, and work ethics

Education and Training

At a time when on-going education and training are becoming more critical, steel producers are less able financially to provide training to workers or to participate in school-to-work activities in the community. Only a small percentage of current workers take advantage of education and training assistance benefits despite the added job security that new skills would give them.

Company-provided training is mostly done in-house rather than through the local education institutions or vendors. This is consistent with national findings from the American Society of Training and Development (ASTD), which have noted that employers across the board are purchasing less training from outside entities.

At the secondary level, the firms note that schools tend to counsel youth toward four-year colleges rather than vocational skills training or certificate programs. Although schools are perceived as wanting youth to attend universities and as being focused on Indiana Statewide Testing for Educational Progress (ISTEP) test results, the employers complain about basic skill deficiencies among job applicants.

Education and Training Assistance

➤ Most area steel companies and the United Steelworkers of America jointly manage Career Development Programs. The Institute for Career Development (ICD), the national office that guides the process, is a local



resource, which benefits area mills. Unionized employees apply for training assistance through the program. However, the pillars of the program are the customized courses which promote portable skills training, career development training, personal development, and life long learning. In 2001, the companies and Union jointly sponsored more than 264,472 hours of learning in the region's Career Development Programs (CDP) learning centers, and hundreds more individuals attended class on campus that year. Over the past decade, learners have invested well over 3,000,000 total hours in local CDP instruction. The area joint programs have successfully involved, on average, between 20-25% of eligible workers annually. Few, if any, programs have impacted so many steelworkers year after year. According to the Report of the Twentieth Century Fund Task Force on Retraining America's Workforce (No One Left Behind, 1996, p.37), the best way to develop the skills of all employees is to involve them in the process as joint labor/management programs do.

➤ There are tuition reimbursement programs for both hourly and salaried workers.

Company-Provided Training

Most training is provided in-house, but firms also use local schools such as Ivy Tech and private training vendors. The firms provide:

- Safety
- Environment
- ISO
- ISM
- Apprentice training
- First aid and CPR
- Hiring orientation
- Supervisory/management training
- PC training
- Statistical process control
- Craft and craft skill refresher
- On-the-job training

Future Workforce Preparation

- Most local secondary and postsecondary schools do not adequately prepare students for steel jobs because of the uncertainty in steel. The firms perceive that area high schools promote students to attend the standard four-year college institutions. Students are scheduled to meet certain mandatory classes to graduate and have very little time remaining to take vocational courses. The steel companies believe that schools in the area do very little to promote vocational and technical education, but they don't exclusively place the blame on the shoulders of the school system; part of the responsibility falls on the parents, employers, and community. Work ethics begin at home with the parent or parents. There is a need for parents'

involvement prior to and during the students' early school years. The companies indicate they don't have the resources (staff or revenue) to promote and actively participate as they once did in school-to-work programs, mentoring, pre-apprenticeship, and other company and school sponsored programs.

- Steel representatives feel most educational institutions are moving further away from vocational education and workplace skills. ISTEP appears to be the focus of most high schools. Even with the ISTEP as a priority some schools are challenged academically to meet the requirements.
- Both high schools and postsecondary institutions offer career and skill development opportunities for students. Parents and students should take more responsibility for developing work ethics. Many adults are not good role models for the young.
- Some secondary and postsecondary institutions that have developed relationships with the steel mills prepare candidates adequately for the industry's initial needs.

Vision, Goals, and Strategies of the Workforce Boards

The steel producers and unions may not understand the role that Workforce Investment Boards can play in addressing their workforce problems. Although the firms have issues with community attitudes toward jobs in the industry, perceptions of vocational education, the role of parents and role models in developing work ethics, and basic and technical skill proficiencies among applicants, they do not appear to see a role for the boards in working on those issues. For those that are aware the boards and their work, the mills have narrowly verbalized their needs to only include knowledge of grant opportunities and identification of minority recruiters.

The Workforce Investment Boards of Northwest Indiana have developed a vision, mission, goals and strategies to realize them with the help of a broad spectrum of leaders from across the seven counties.



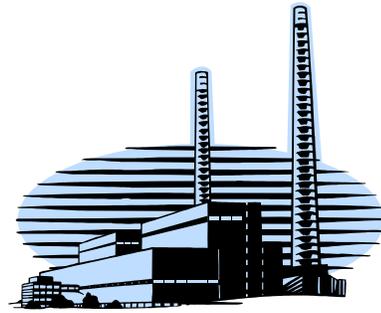
Vision

Northwest Indiana will have a diverse workforce that is skilled to meet today's and tomorrow's needs in a competitive economic environment, and will develop its future workforce by ensuring all youth are prepared for further education, training, and work. Employers, workers, and youth will be served by a public/private system that is high performance, accountable, efficient, and rich in the information that the citizens of Northwest Indiana need to make good decisions about themselves and their work or business.

Mission

The Community Workforce Compact, through a coalition of business, education, community and government, offers support to our business and industry, workers, youth, and education and training institutions to help communities realize the vision for the region.

Opportunities for Action



- Steel producers have many common challenges, particularly with regards to the skills required for applicants who attempt to enter the crafts. Developing a "craft preparation" program that could provide benefits to both the employers and the workers.
- The skills of entry-level applicants are also a shared challenge. Because the mills recruit heavily through the WorkOne centers, a partnership of the WorkOne partners, the mills, and a local education institution could lead to development of a certification program that would qualify completers to apply at the mills. There is currently a Certificate of Achievement (CTA) for advanced manufacturing that may be explored to determine whether it is adequate or has value as a minimum application requirement. As of January 2003, 862 advanced manufacturing CTAs have been awarded in Northwest Indiana. It would be of interest to explore whether the designation added any benefit to the recipients, as well as to determine why none have been awarded in Lake County (at the present, all 862 have been awarded in the Center of Workforce Innovations from: Jasper, Newton, Starke, Pulaski, LaPorte, and Porter Counties).
- The USWA and area steel plants have committed to and built a strong system for encouraging workers to upgrade their skills through ICD's career development programs. If the programs were better understood and supported, they could keep the steelworkers educationally ready for new technologies or work systems that are certain to emerge.
- A marketing strategy with the region's educational institutions could be employed as a primary recruitment tool. Many talented youths are interested in working while concurrently attending college. Applicants value education and favorably perceive employers that provide them with degreed and lifelong learning opportunities.
- In addition, ICD could present their programs and collaborate with the WorkOne and Express Centers throughout the seven counties as part of an overall strategy to enhance employable skills to laid off steelworkers.
- Recently, for recruitment purposes, Ispat Inland, Inc. with Workforce Development Services of Ivy Tech State College and Lake County WorkOne Centers have been pleased with the results. Their model could also be explored as a model for other mills.
- Bethlehem Steel Corporation, Midwest Division of National Steel, United Steelworkers District 7, Beta Steel Corporation, Portage Township School Corporation, Porter County Vocational Education, Northern Indiana Public Service Company,

Kankakee Valley Workforce Development Council, collaborated in a project titled "Millwright Partnership = Skilled Workforce." The objective of this project is to develop a continuing and sustaining partnership between local industry and area schools. The schools teach workplace competencies identified by regional employers in order to enhance the employability of participating students. Their program could also be explored as a model for other mills.

- Steel producers, and in fact, all of manufacturers suffer from an image problem. Many parents, youth, and school personnel are unaware of the high skill, high wage opportunities that abound. A joint marketing and education effort could reverse this problem. The facts need to be shared

to enable youth to make wise career decisions, and their parents to make wise investment decisions:

"Of the 67% of the high school class of 1997 who enrolled in higher education immediately after graduation, two-thirds matriculated in four-year colleges to earn bachelor's degrees, but only 23% of all employment requires this level of education. Thus, by the mid-1990 at least one in three university graduates was underemployed.... While increasing numbers of college graduates were ending up in low-wage service jobs, the nation's economy was generating record numbers of unfilled positions for technicians in high-skill/high-wage technical jobs." [Getting Real: Helping Teens Find Their Future; (2000); Kenneth Gray; page 2].

Industry Data



Northwest Indiana is a top producer of steel in the United States, which has always been the largest steel producer in the world. In 1996, however, Ohio was ranked the number one steel state in the nation for the first time. Ohio produced and processed \$5.3 billion in steel that year, while Indiana trailed at \$4.9 billion. Pennsylvania employed the most workers (36,300 compared to 35,400 in Ohio and 33,300 in Indiana), but only ranked 3rd in production at \$3.6 billion.

Critical factors impacting the region's industry include:

- 8000 jobs will be vacated over the next 5 years due to retirements;
- The average age of steel workers is 53;
- The Pension Benefit Guaranty Corporation (PBGC) has taken over the pension programs for Bethlehem and National Steel. International Steel Group (ISG) has purchased most of Bethlehem Steel's corporate assets, and United States Steel Corporation (USS) has purchased most of National Steel's assets;
- International Steel Group has purchased most of LTV's assets and has settled a formal labor contract with the USWA.

Industry projections from the Indiana Department of Workforce Development (DWD) predict a decline of 5,000 workers in primary metals between 1998 and 2008:

Occupational Area	1998 Actual Employment	2008 Projected Employment
Primary Metals	31,940	26,920
Fabricated Metals	4,470	4,800

Source: Indiana Department of Workforce Development

However, this is actually an improved scenario over the ten-year projections that were issued last year by the Department of Workforce Development DWD. The 1996 actual employment in primary metals was 33,080 and fabricated metals employed 4,368. DWD had projected that the 2006 levels would be 23,849 and 4,638 respectively. The most current projections for 2008 paint a brighter picture.

The following tables compare the number employed (in thousands), average weekly earnings, average weekly hours, and average hourly earnings for 1997, 2001, and preliminary data for November, 2002. Data is presented for manufacturing as

whole, durable goods as subset of manufacturing, primary metals as a subset of durable goods, and steel works and blast furnaces as a subset of primary metals. Data for a few other sectors is provided for contrast. Clearly, over the past few years there has been a steady decline in the number of workers employed in steel. However, there has also been an increase in average hourly earnings (possibly due in part to layoffs of younger, lesser paid workers). The average weekly hours declined from 1997 to 2001, but figures for November 2002 reveal an increase above the 1997 average. This may be due in part to having fewer workers to accomplish the work.

Annual, 1997

Industry	Number Employed in thousands	Avg. Weekly Earnings	Avg. Weekly Hours	Avg. Hourly Earnings
Manufacturing	50.3	\$786.68	42.5	\$18.51
Durable Goods	40.6	\$796.74	42.2	\$18.88
Primary Metal Industries	30.0	\$859.32	42.0	\$20.46
Manufacturing - Steel Works, Blast Furn.	28.5	\$877.80	41.8	\$21.00
Industrial Machinery and Equipment	3.5	\$705.47	43.9	\$16.07
Nondurable Goods	9.7	\$747.18	43.9	\$17.02
Chemicals and Allied Products	1.9	\$770.77	45.5	\$16.94

Source: Indiana Department of Workforce Development

Annual, 2001

Industry	Number Employed in thousands	Avg. Weekly Earnings	Avg. Weekly Hours	Avg. Hourly Earnings
Manufacturing	43.9	\$862.36	41.4	\$20.83
Durable Goods	35.4	\$878.80	41.2	\$21.33
Primary Metal Industries	26.1	\$965.32	41.2	\$23.43
Manufacturing - Steel Works, Blast Furn.	25.0	\$978.50	41.2	\$23.75
Industrial Machinery and Equipment	2.8	\$717.38	41.3	\$17.37
Nondurable Goods	8.5	\$786.01	42.1	\$18.67
Chemicals and Allied Products	1.6	\$687.30	36.5	\$18.83

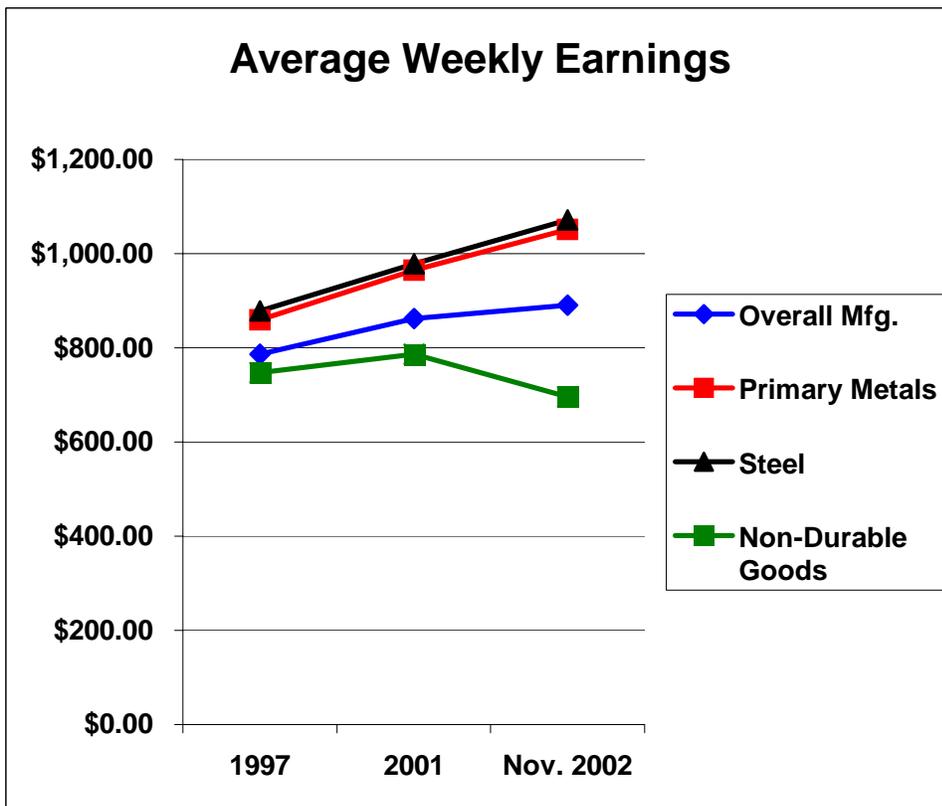
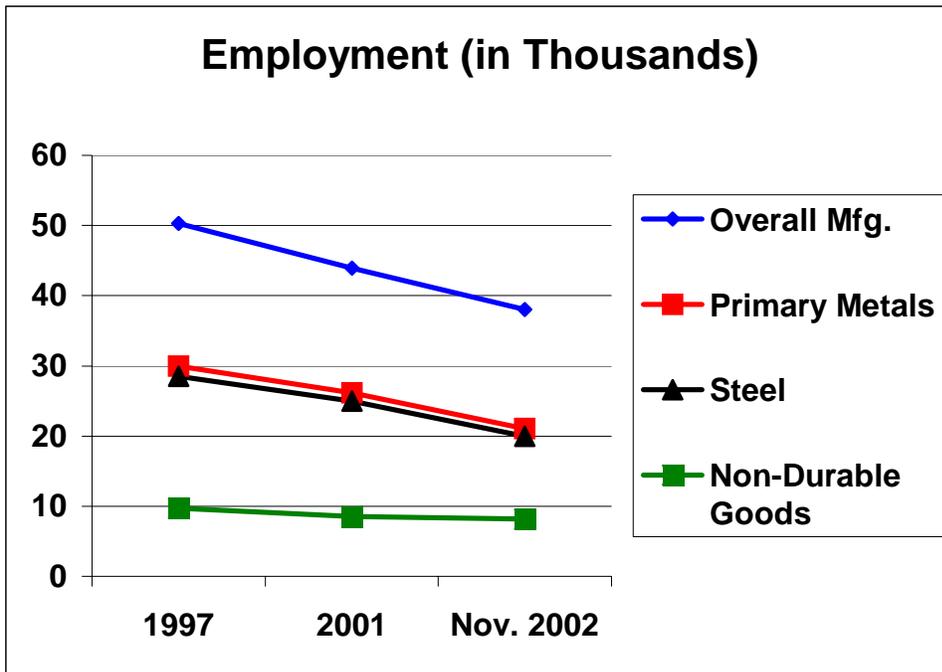
Source: Indiana Department of Workforce Development

November, 2002 (Preliminary)

Industry	Number Employed in thousands	Avg. Weekly Earnings	Avg. Weekly Hours	Avg. Hourly Earnings
Manufacturing	38.0	\$890.34	41.8	\$21.30
Durable Goods	29.8	\$940.51	42.1	\$22.34
Primary Metal Industries	21.1	\$1,050.85	41.9	\$25.08
Manufacturing - Steel Works, Blast Furn.	20.0	\$1,070.96	41.9	\$25.56
Industrial Machinery and Equipment	2.5	\$763.23	41.1	\$18.57
Nondurable Goods	8.2	\$695.69	40.4	\$17.22
Chemicals and Allied Products	1.4	\$740.53	35.5	\$20.86

Source: Indiana Department of Workforce Development

The charts below graphically depict the data from the previous tables, "Steel" refers to "Steel works, blast furnaces, and rolling and finishing mills." Steel is a subset of primary metals.



The downturn that the country is experiencing is due to increased imports resulting from a world steel surplus capacity attributed to economic downturns in Asia and the CIS (Commonwealth of Independent States). However, a global steel shortage was predicted for the first half of 2003. In October, World Steel Dynamics noted a tight supply of steel sheet in China, rising prices in Russia and Western Europe, tightening coke supplies, low steel user inventories in most countries, and other factors. Major steel mills in the U.S. and

Canada are currently achieving 10% or higher increases in one-year contract negotiations for steel delivery in 2003.

Although employment is expected to continue to decline, there will be good-paying opportunities for people with strong technical skills and training in complex manufacturing processes. As older mills are closed or technology is upgraded and new processes and product tools are implemented, the steel worker will need to become a more sophisticated and adaptable user of technology.

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