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U.S. WORKERS AND THE NEW INDUSTRIAL REVOLUTION: PART I

by Charles Jezseck

Ed. Note: This LCR guest article is an excerpt of comments made by the author on Sept. 26, during a conference held at U.C. Berkeley on the impact of Reagan Administration policies. Mr. Jezseck is Research Director of the California AFL-CIO. Here he discusses the enormous impact of new technologies on employment and on wages, job content, working conditions, health and safety. In Part II (LCR No. 50, next month), he will discuss how unions can respond to the challenge of new technologies.

At the heart of what some have called the "new industrial revolution" is the microprocessor, a tiny silicon chip imprinted with electronic circuitry. Microprocessors have permitted a dramatic miniturization of computers, allowing new degrees of automation which even ten years ago would have seemed impossible.

Grouped together with other related equipment, microprocessors have laid the foundation for the development of what has been termed computer integrated manufacturing or CIM. There are two parts to CIM. The first is computer-aided design or CAD. CAD is the design, drafting, and analysis of products or processes with computer graphics on a screen. CAD allows a drastic speed-up in the design phase of a new product or process development. Used most extensively in auto, aircraft and other durable goods manufacturing sectors, CAD has introduced tremendous productivity increases. At Pratt and Whitney, a Connecticut aircraft engine company, the use of CAD to design turbine blades has resulted in a five-to-one reduction in labor utilized and a fifty percent decline in product design lead time.

The second part of CIM is computer-aided manufacturing or CAM, the computer control of production machinery. The most well known example of CAM is the industrial robot. There are presently 2000 robots used in U.S. manufacturing facilities, and their number is expected to grow sharply in the next decade. Today most industrial robots perform simple assembly operations, such as spray painting Chevettes at GM's Lordstown, Ohio plant, or welding car doors at Chrysler's Dodge plant in Belvedere, Illinois.

As the number of robots multiplies, robot "intelligence" increases as well with various sensory features like touch and sight. General Electric, for example, is designing a robot which can distinguish among any of 200 different parts. All robots will be designed to provide the flexibility necessary for rapid product mix alterations.

Robot production also leads to significant productivity gains. At John Deere, a major farm implement manufacturer, CAM has reduced jobs in certain departments by 30% and increased total productivity by 45%. And linked together, CAD/CAM are awesome. McDonald Douglas once needed 12 employees each working six weeks to cut the three miles of metal tubing required for one DC-10. After CAD/CAM, the same amount of cutting was being handled by three workers in only eighteen minutes.

So far this linkage of computerized design and manufacturing into computer-integrated manufacturing has only been applied to a few individual departments in a small number of major corporations. The ultimate aim of a fully automated "turn-key" factory overseen by a small cadre of technicians and craft workers will not become common for at least twenty years. Even so, the continued application of microelectronics to the workplace is already having a major impact.

One key concern is the impact on employment levels. Studies so far are contradictory. A recent study by Clive Jenkins and Barrie Sherman of Britain's Scientific, Technical, and Managerial Union contends that microelectronics will reduce total employment in the United Kingdom by 23% or five million jobs by the year 2000. But other studies argue that this kind of automation will have only a minor impact on employment levels, and that other factors, like national macro-economic policy, are much more important.

Whatever the number of jobs lost, there is little doubt that the new automation will dramatically alter the existing occupational mix. General Electric claims that robots will make more than half of its 37,000 assembly workers jobless in ten years. Some experts feel that these assembly jobs will be replaced by new programmers, analysts, engineers, and skilled craft workers who will be necessary to provide the software and hardware design and service computer systems.

However, many others believe the microelectronics techniques will create more unskilled jobs in various service and white collar sectors than they destroy, adding to the millions of poor jobs already existing in these areas. It is unclear yet which tendency will prevail.

Job losses due to new technologies will probably pose the greatest threat to organized workers, especially those located in manufacturing. Of the seven million assembly line jobs to be affected by automation before 1990, it is estimated that 50% will be lost by union members. The IBEW, IAM, and the IUE will be hurt in spite of President Reagan's defense budget increases, and the UAW is already suffering from declining membership rolls.

Workers who manage to keep their jobs or who find new ones created by new technologies will likely be faced with deterioration of health and safety conditions and unacceptable workloads. Computer technologies will permit intensive monitoring of worker productivity, and video display terminals and other new technologies pose many health hazards, some as yet not fully understood.

Overall, microelectronics will certainly have big impacts. It could well mean fewer jobs, less-skilled jobs, unhealthy work, and more managerial control. But could the new technology actually improve work? This is the challenge the labor movement has to take up.