Labor Unions and Technological Design:
Entry Points for Change

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Contemporary industrial production is a legacy of an industrial system that achieved production gains by increasing efficiencies in individual tasks, by concentrating information and control toward the top of a multi-layered hierarchy, and by adjusting human activity to the capabilities of new technologies. These methods are consistent with a technocentric design orientation. Technocentric designers over-estimate what computers and machinery can achieve on their own and underestimate the social and organizational contributions to production.

Challenging the assumptions of technocentric design, developers of skill-based, participative systems critically assess the configuration of machinery, tools, and information systems, as well as the methods of organizing the workplace.

Skill-based, participative solutions to product and process problems thus require critical engagement with all phases of technological development, which includes how information systems, machine tools, and other technologies are selected, implemented, and customized. Moreover, the early stages of design, where the defining characteristics of the eventual system are most open to change, provide significant opportunities to build in high performance considerations. These considerations include continuous improvement, ongoing learning in both process skills (e.g., problem solving, teamwork, communication) and technical skills (e.g., statistical process control, computer control systems, new equipment), good wages, and a comfortable workplace. To succeed, high performance work

systems must invest significantly in training to support continuous learning for workforce participation, problem solving for production, and workforce participation in new product and process design.

Achieving high performance requires not only critical reform of the assumptions of individual designers, but also constructive engagement with the institutional determinants of the design context. For example, the pervasive participation characteristic of high performance systems can thrive only where workers are genuinely free to express their views, exercise judgment, and directly influence design decisions, and where there are independent democratic structures for formulating and expressing workers' viewpoints at all levels. In general, these determinants include organizational culture, increasingly competitive, segmented markets, and the affordances and constraints of new technology. Organizational, economic, and technological arenas thus provide fruitful arenas for changes in design processes.

In the United States, labor unions provide one of the few institutional structures with access to each of these arenas. Drawing on their extensive experience with a variety of labor strategies involving the design of technologies and workplace organization, panelists will critique design practice, illustrate models of skill-based participative design, identify entry points for change, and outline the supporting economic, organizational, and political infrastructure needed to put these changes into place. By juxtaposing their views with each other and those of panel attendees, the panel will integrate distinct conversations—with special attention to links between designers/ engineers and users/labor—that have taken place in disparate arenas.

ORGANIZER
Todd D. Cherkasky is Research Specialist, Technology and Design, Work & Technology Institute, Washington, D.C. He received B.S. Eng. (computer engineering) and

B.A. degrees from the University of Michigan and M.S. in Science and Technology Studies from Rensselaer Polytechnic Institute where he is continuing work towards a Ph.D. He was Senior Applications Engineer for Xycom, Inc. where he developed industrial automation, machine control, and data acquisition systems for manufacturing and service industries and research laboratories.

PANELISTS

Nicholas A. Ashford, Ph.D., J.D., is Professor of Technology and Policy at the Massachusetts Institute of Technology, Cambridge, MA, where he teaches courses in Environmental and Occupational Health Law and Policy. He is a fellow of the American Association for the Advancement of Science and served on the National Advisory Committee on Occupational Safety and Health, the EPA Science Advisory Board and the EPA National Advisory Council for Environmental Policy and Technology. Dr. Ashford is the author of a major work for the Ford Foundation, *Crisis in the Workplace: Occupational Disease and Injury*, published by MIT Press. He recently co-authored three additional books: *Monitoring the Worker for Exposure and Disease* (John Hopkins University Press); *Chemical Exposures: Low Levels* and *High Stakes* and *Technology, Law and the Working Environment* (Van Nostrand Reinhold).

Harold Salzman, Ph.D., is Director of Research, Jobs for the Future, Boston, MA. He graduated from the University of California, Santa Cruz and received his Ph.D. from Brandeis University. He has served as Director of the Technology, Work, and Organizations Program at the University of Louisville. He was a Research Fellow in the Department of Work Environment and the Center for Industrial Competitiveness at the University of Massachusetts, Lowell. Dr. Salzman's current research focuses on technology design and diffusion, particularly issues involved in skill-based technology design. His research projects include two National Science Foundation funded projects on the social dimensions in design of production systems, both hardware and software. He is co-author of: *Software By Design: Shaping Technology and the Workplace* (Oxford University Press) and *Designed to Work: People and Production Systems* (Prentice-Hall). A current project involves an international survey of machine tool users to examine differences in technology design, technology use, and production organization. This project is being conducted in the U.S., Germany, Denmark, and Japan by the International Research Network on Culture and Production (CAPIRN).

Ray Scannell is Director of Research and Special Projects, Bakery, Confectionery and Tobacco Workers International Union, Kensington, MD. He received a B.A. in history from Boston College and received his M.S. in Organizational Behavior from Cornell University's New York State School of Industrial and Labor Relations in 1981. While at Cornell in the late 1970's he worked as a research assistant in the New Systems of Work and Participation, and has had an interest in and tracked the quality movement and workplace restructuring in the U.S. and abroad since. From 1988 to 1990 he served on the BCT Technology Task Force which studied the introduction of new technology and forms of work organization in BCT industries and their impact on workers and the union. He has served as a member of the AFL-CIO Industrial Union Department's Technology Working Group since its inception, has taught in technology education programs sponsored by the George-Meany Center and the IUD.

Joel S. Yudken, Ph.D., is Senior Fellow and Director for Technology & Workplace Systems, Work & Technology Institute, Washington, DC. A graduate of Rensselaer Polytechnic Institute, he holds a M.S. in engineering-economic systems and Ph.D. in technology and society from Stanford University. He is a co-author of *Making Changing Happen: Six Cases of Unions and Companies Transforming Their Workplaces* (WTI) and the report *Smart Workers, Smart Machines: A Technology Policy for the 21st Century* (WTI). He is a former Professional Staff Member, U.S. House Committee on Banking, Finance and Urban Affairs, and Congressional Science & Engineering Fellow in the Office of U.S. Senator Barbara Boxer. He was a Postdoctoral Research Fellow, Project on Regional and Industrial Economics, Rutgers University, where he co-authored *Dismantling the Cold War Economy* (Basic Books). He directed the ACM-sponsored Project on Funding Policy in Computer Science and currently heads projects on high performance labor-management networks and labor participation in workplace modernization.