3. Lessons from the Shop Floor

Now we turn to a more detailed analysis of our field work in order to understand how employment systems actually operate. In particular, we analyze the related processes of skill development, problem solving and innovation in selected fabs. In the first two studies, external factors such as the number of processes and products being produced and the stability of the organization are vastly different, and these dissimilarities have an impact on the functioning and effectiveness of the fabs’ problem-solving systems. In the third study, external factors are common and include high turnover of production workers, and this allows a more direct study of the effectiveness of the HR system in one environment. In the fourth study, a case study of the development process at two fabs is combined with a multi-fab study of shop floor practices to explore management of innovation.

“The Role of Skill Upgrading in Manufacturing Performance” and “Problem-Solving Structures” are both case studies comparing a high-performing and a low-performing fab. In both cases, the external environment exhibits more variation between fabs than the HR systems themselves. However, in both studies, the low-performing fab would benefit from making changes in the training and problem-solving structures so that they functioned more effectively. The first case study documents the skill upgrading systems for production workers so that operators can do planned equipment maintenance and technicians can do planned maintenance and repairs. Engineers do much less maintenance in these fabs, and the fabs do not use vendors for maintenance work. Production workers at both fabs do few SPC activities. At the Japanese fab, process engineers are involved with the advanced SPC system; the U.S. fab relies much less on its less-advanced SPC system, which accounts for part of its lower performance even with its employee involvement in equipment maintenance. In addition, the U.S. fab faces a much more challenging environment where the organization is being restructured and where production encompasses four processes with many products combined with the development of four new processes. The Japan fab is producing a stable product. The second case study is similar in that a high-performing U.S. fab is producing an old and stable product and a low-performing U.S. fab is in the process of reorganization and produces a large variety of products in a weak product market. Although both fabs have extensive training systems for problem solving, one U.S. fab does a much better job of involving the production workers in solving problems while the other fab relies much more on engineers.

“Human Resource Policies in an Environment of High Labor Turnover and Rapid Technological Change” compares two fabs facing similar labor and product markets. Both rely heavily on engineers for problem solving in the face of high turnover of production workers, who receive little on-going training. The higher-performing company had invested more in information technology and automation than the lower-performing company, and this technology improved the information available to engineers for problem solving and prevented many operator mistakes.
“Innovation on the Shop Floor” explores how two successful companies provide incentives for creativity and systems for control in managing innovation by engineers and how fabs organize work so that production workers develop and use problem-solving skills.