

CHAPTER SIX

ISSUES IN EMPLOYMENT AND THE DIVISION OF LABOUR

INTRODUCTION

1. Main Issues

Chapter Six returns to the case studies to highlight two issue areas in employment and the division of labour that stemmed from each firm's efforts to carry out productive adaptation, and in turn influenced union-management relations. The first centred around the need to train workers in-house and persuade them to remain within the firm. Although IMEP and METASA displayed distinct patterns of productive adaptation, both faced skill constraints on their ability to adapt that could only be met through in-house training and apprenticeship programmes. Government wage policy contributed to high labour turnover rates and labour supply problems in both firms, thereby lending urgency to their efforts to resolve this issue.

The second issue area concerned the distribution of decision-making. Each firm's processes of productive adaptation required a significant degree of shop-floor decision-making regarding labour allocation, and changes in output mix, input usage and/or machinery utilization. Shop-floor supervisors could not merely implement management policies and enforce its decisions; rather they had to reorganise work constantly, ensure labour's cooperation, and develop an effective form of worker accountability under uncertain production conditions. This called for negotiations and conflict resolution directly at shop-floor level. Parts One and Two of this chapter discuss these two issues in employment and the division of labour respectively. The Conclusion compares the results of the two case studies and affirms that both firms attempted to resolve these issues through plant bargaining around social benefits and incentive pay.

This chapter is based upon the cross-referencing of numerous exploratory interviews with workers, union leaders, supervisors, administrators, engineers and enterprise directors. The above two issues emerged consistently in these interviews, which approached the recent history of each firm from distinct angles. Interviewees in administrative and technical offices, as well as

on the shop floor, repeatedly pointed to these issues when describing specific processes of productive adaptation, and those factors affecting the firm's ability to adapt in each case. The enterprise director, human resources department head and union leaders in each firm highlighted these same issues when explaining changes in labour policy over the eight-year period. On the shop floor, supervisors and workers discussed them when describing their jobs and the recent history of their area within the plant. Together the interviews provided a firm basis by which to identify these as the main labour issues arising from each firm's effort to carry out productive adaptation.

By defining these issues, Chapter Six provides an important step in this study of enterprise industrial relations. Chapter Seven will demonstrate how pressures to resolve these issues generated demands upon other areas of labour policy and influenced the evolution of union-management relations. In-house training and shop-floor decision-making merit attention in themselves as essential aspects of each firm's efforts to cope with crisis. In this thesis, they play only a secondary role and do not figure among the main subjects of study due to information constraints. There was not sufficient information to measure the extent of each problem, document precisely the nature of each firm's response and evaluate its degree of effectiveness.¹ For example, interview results showed that both firms introduced in-house training classes in response to immediate skill constraints. However, there was no information on the number of workers attending these courses, completion rates, and the degree of skill acquisition.

2. Sources of Labour Instability

Chapter Six is concerned primarily with the consequences rather than the causes of labour instability, which are mentioned only briefly here. Instability in labour supply stemmed from military service and other forms of authorised leave, absenteeism and high labour turnover rates.² From 1982 to 1984, workers volunteered for militia brigades, remaining away from the firm for three months or longer. Yet this did not have a severe impact on production because management and the union jointly selected workers who could join the brigades, denying authorised leave to those who could not be replaced. From 1985 to 1987, military service and the reserves replaced the voluntary militia brigades, which coincided with the period when it

became more difficult for each firm to replace skilled workers.³ The enlistment of workers contributed to skilled labour shortages in both enterprises.

The decline in real wages led to high labour turnover rates in 1984-87, as highlighted in Chapter Five. The purchasing power of basic wages often changed abruptly due to periodic currency devaluation and government-authorised wage adjustments. IMEP registered fluctuations in labour turnover rates between production quarters, reflecting these changes in real wages and its efforts to compensate in other areas of labour policy, as discussed in Chapter Seven. These efforts could only reduce labour turnover temporarily as high inflation rates continued to erode real wages. By 1987, the average basic wage covered 13 per cent of the cost of the expanded basic goods basket, having dropped from 37 per cent in 1985. Interviewees in METASA also reported fluctuations in labour turnover rates among workers in specific occupations. While Chapters Five and Seven together provide an explanation for these variations in labour turnover, Chapter Six focuses upon the resultant issues in employment and the division of labour.

PART ONE: SKILL CONSTRAINTS AND IN-HOUSE TRAINING

Part One compares skill requirements generated in the course of productive adaptation to the skill profile of workers in each firm or those available from external labour markets. It highlights skilled labour supply problems and high labour turnover rates, and outlines each firm's efforts to overcome the resultant skill constraints. It thereby aims to portray the dynamics of productive adaptation, skill formation and labour turnover in each enterprise.

Part One does not attempt to establish a point-by-point comparison between the two enterprises as they did not have parallel information systems. For example, these firms did not keep similar data on labour turnover rates. In IMEP, the payrolls provided the most reliable source on labour turnover. METASA did not facilitate access to these records, but supplied detailed information on workers' seniority by production section. These sources indicated the type of pressures confronting each enterprise, but did not allow for a controlled comparison between them.

1. IMEP

1.a. New Skill Requirements and Skilled Labour Supply Problems

Entry into equipment and parts production created a gap between IMEP's new skill requirements and the skill profile of both its own workers and those who could be hired from external labour markets. Through on-the-job experience, IMEP workers had acquired skills in parts preparation, welding and the assembly of steel structures, and storage and transport tanks.

While equipment production also involved parts preparation, welding and assembly, the introduction of this product line generated additional requirements in these occupations. As compared to structures and tanks construction, equipment production required greater precision and also higher standards of welding. It also called for an ability to work with geometrical concepts and equations, read equipment designs, and manipulate measurements in inches and the metric system. Only a few IMEP workers had previous experience in constructing agricultural equipment, and most had never studied geometry, having only attended primary school.⁴

The introduction of imported machinery and technical processes also generated new skill requirements. In the 1970s and 1980s, Nicaraguan workers tended to acquire machine tool experience in either manufacturing firms or small workshops. Graduates of technical training institutes constituted a minority of machine tool operators. From 1984 to 1987, IMEP installed twenty-seven machines to facilitate parts production. Since about a third of these machines were of a type rarely found in Nicaraguan firms or workshops, the firm could not count on a pool of skilled workers with experience in operating them. These included milling, broaching and gear-cutting machines, and cylinder, surface and universal grinders.

IMEP also imported machine tools commonly found in Nicaraguan workshops such as lathes, eccentric presses and universal planing machines. Yet in attempting to hire workers with experience on these machines, it had to compete with the new state investment projects, maintenance and repair shops in other manufacturing and agro-industrial units, and small informal sector shops. Finally, as IMEP was to install Nicaragua's first industrial-scale heat

treatment plant, it was not able to hire workers with previous experience in this area.⁵

IMEP encountered this skill gap just as Nicaragua's manufacturing sector began to face high labour turnover rates and labour supply problems. Enterprise director, Herzan Garcia, recalls:

By 1984, we were committed. We had signed the contracts for the new machinery imports. We had formed a strong technical and administrative team with good foreign technical assistance. We had secured production orders for the upcoming months. Yet workers began to leave the firm. The new machinery was going to arrive and we were not going to have the people to operate it.⁶

Because IMEP did not keep systematic data on labour turnover rates, the figures below are based on a comparison between the payrolls for the first week of each production quarter from January 1985 to June 1987.⁷ Table 6.1 shows the percentage of workers who left the firm in each quarter. The first set of figures refers to total labour flight, whereas the second excludes workers with less than three months in the firm.

Table 6.1: IMEP: Leavers as a Percentage of the Total Number of Workers Initiating the Period 1985-87

Production Quarters	1985				1986				1987	
	1	2	3	4	1	2	3	4	1	2
Total	30	19	25	26	28	31	21	22	29	24
Excluding those with less than three months	n.i	8	14	12	17	21	13	9	17	12

Source: IMEP, Human resources department, payrolls
January 1985 - June 1987

At least one out of five production workers left IMEP during each three-month period from 1985 to June 1987. However, a number of these workers had been employed there for less than three months. In four out of ten periods, they represented at least half of those leaving the firm. Because the majority was unskilled, labour turnover among this latter group did not contribute significantly to skilled labour shortages. In contrast, those with more than three months in the firm had already received on-the-job training in IMEP. This group included some of the most experienced and versatile workers in the equipment line, as described by equipment assembler, German Prado.

We had 20 worker innovators here. Only eight remain in the firm today. These are skilled welders and assemblers, some of whom are also mechanics and electricians. They can easily find jobs in firms or repair shops. Here in IMEP, they learned to construct equipment, some of which had never been produced in this country before.⁸

The payroll alone could not indicate whether workers left of their own accord or were dismissed. IMEP's enterprise director and union secretary general both stated that the firm rarely fired workers and that labour turnover consisted primarily of workers who left for higher-paying jobs in other manufacturing units, investment projects or the informal sector. This was confirmed through informal interviews with several workers in each production section.⁹ War conditions aggravated skill constraints, particularly in the 1985-87 period. Between 5 and 11 per cent of IMEP workers were granted authorised leave in all but one production quarter between 1985 and 1987, mainly to join the military.¹⁰

From 1985 to 1987, skilled labour shortages constituted one of the main constraints facing IMEP, according to workers, plant supervisors, the enterprise director, and production, technical and human resources department staff.¹¹ These interviewees highlighted this factor when listing those with the most significant impact upon the firm's operations from 1985 to 1987. Skilled labour shortages affected its ability to ensure product quality, meet delivery dates, and utilise effectively the newly-imported machinery.

1.b. Response to Skill Constraints: In-House Training

How did the firm respond to this constraint? IMEP did not attempt to lower its demand for skilled labour through changes in output, inputs or machinery. On the contrary, it continued to introduce new products, construct a wide range of equipment at varying levels of technological complexity, and produce an increasing number of equipment parts in-house.¹² Likewise, the firm continued with its investment programme, installing newly-imported machine tools and purchasing the four large heat treatment ovens and new electrical installations.¹³

IMEP replaced those who left and expanded employment from an annual average of 120 production workers in 1984 to 188 in 1987.¹⁴ Yet job applicants generally did not have equivalent skills to those held by workers leaving the firm. IMEP hired unskilled workers and trained them on the job to take on skilled work. Human resources department director, Manuel Gomez, stated:

The demand for skilled personnel is hardly ever met by hiring workers from outside IMEP. IMEP can hire welders with some experience, but rarely skilled welders. Rarely can it hire skilled machine tool operators. Those who come to look for a job are young people with a basic education, but with little experience.¹⁵

From 1985 to 1987, over half of the newly-hired workers were classified as unskilled in all but one production quarter, according to company payrolls. This group included workers with no previous work experience or technical training who were hired mainly as unskilled auxiliary workers. The majority of those classified as skilled displayed general aptitude and had some previous work experience, but needed further training to meet the demands of their new jobs.¹⁶

Under these conditions, IMEP's ability to adapt depended upon the capacity of workers in key occupations to acquire new skills and to train others through the apprenticeship system. Workers stressed this point when describing their role in developing the equipment line. To begin equipment production, the firm hired five workers who had produced equipment for rice-drying plants in a small workshop during the 1970s. It also transferred welders and assemblers from the structures and tanks section, and hired additional welders and unskilled workers. Welders provided on-the-job training to unskilled auxiliary workers. At the same time, by working alongside equipment assemblers, these welders learned the latter's trade. The promotion path proceeded from unskilled auxiliary worker to welder, assembler and then area supervisor.¹⁷

In the machining section, on-the-job training of production workers formed an important aspect of the daily work of the production manager and area supervisor. The supervisor decided when to promote workers from unskilled auxiliary positions to machine tool operator and then through three skill levels on each machine. Workers could then be transferred to machine tools requiring higher qualifications. As skilled labour shortages became more severe, the production manager and area supervisor gave special attention to training assistants quickly to take over as operators.¹⁸ In both the equipment and machining sections, there were frequent opportunities for promotion due to output increases, investment in new machinery, high labour turnover rates, and difficulty hiring skilled workers from external labour markets.

IMEP also introduced in-house technical classes and sent workers to courses outside the firm. This programme was not merely part of a management-initiated strategy for developing capacity in equipment and parts production. The initiative came from organised labour and IMEP's engineering and technical staff, in coordination with the enterprise director and human resources department. The union, engineers and foreign technical advisors introduced courses in response to immediate skill constraints on the firm's ability to carry out specific aspects of productive adaptation.¹⁹ They also organised welding classes under pressure from customers to introduce products requiring higher-quality standards.

As the firm developed its design office, the technical staff offered classes for workers in reading equipment designs. After purchasing the heat treatment ovens and new electrical system, two

of IMEP's foreign technical advisors conducted classes for those workers who would participate in the installation and start-up phase of these investment projects. When it expanded its maintenance department, one technical advisor offered classes for industrial electricians. In addition, management and the union agreed to send a group of workers to classes in the operation of lathe and milling machines coordinated by the Ministry of Industry and the National Training System (*Sistema Nacional de Capacitación: SINACAP*).²⁰ Finally, adult education classes organised by the union enhanced the firm's training programme, even though they were not introduced in response to skilled labour shortages. These courses were designed by the Ministry of Education to follow up the 1980 literacy campaign and ensure that all workers completed the fourth grade of primary school.²¹

At the initiative of its engineers, IMEP took advantage of Nicaragua's new international relations to obtain fifteen foreign technical advisors from nine countries. This assistance was available through both bilateral government agreements and the technical assistance programmes of non-governmental organisations. IMEP used this opportunity to enhance its own training programme. It assigned five advisors from Cuba, Argentina, Austria and West Germany to train workers directly in the plant. Each advisor instructed a group of workers in one of the following areas:

1. cutting, forming and welding stainless steel, and quality improvements in welding, to allow for the introduction of new products;
2. operation of the new machine tools and heat treatment oven to facilitate parts production; and
3. reorganisation and expansion of the maintenance department to meet increased demands resulting from the incorporation of new machinery.²²

When the machining section faced a particularly severe skill constraint in 1987, IMEP's director began to arrange for foreign technical assistance from Cuba to train workers directly in the plant.²³

In sum, IMEP faced skill constraints in its capacity to develop the equipment line. Likewise, machinery utilisation was limited by the shortage of skilled workers to operate the new multi-

purpose machinery. To overcome these constraints, it relied upon its traditional apprenticeship system, introduced technical training classes, and employed foreign technical advisers to train workers directly in the plant. Throughout the period under study, high labour turnover rates undermined its effort to build up a skilled work force in equipment construction. This intensified pressure on IMEP to train workers and persuade them to remain within the factory.

2. METASA

2.a. Skill Requirements and Skilled Labour Supply Problems

Like IMEP, METASA faced new skill requirements, skilled labour supply problems, and high labour turnover rates in key occupations. From 1984 to 1987, state investment projects and military construction generated a demand for METASA's products and skilled labour simultaneously. Faced with foreign exchange constraints on its own investment capacity, METASA depended upon skilled workers to keep the pipe section in operation. These workers reconstructed old machinery, carried out maintenance and repair work, fabricated spare parts on a one-off basis, and implemented minor improvements to the existing production process.²⁴ These adjustment processes increased the demand for skilled mechanics, electricians and machine tool operators, and also depended upon the firm-specific knowledge and experience held by senior workers.

According to monthly figures compiled by its human resources department, between 6 and 13 per cent of METASA's employees left the firm during each production quarter. These figures do not offer a basis of comparison with IMEP because they include all employees, about 40 per cent of which were not production workers.²⁵ Nevertheless, they do suggest that leavers represented a smaller percentage of the total number of workers in METASA than in IMEP.

Interviewees highlighted skilled labour constraints and high labour turnover rates among mechanics, electricians and machine tool operators.²⁶ Formerly, METASA had been the main industrial employer in Tipitapa, a small town outside Managua. From 1984 to 1987, investment projects in a sugarmill and geothermal energy plant, as well as military construction projects, began to offer alternative employment for workers in these occupations. Workers with these

skills could also shift to informal productive activities when formal sector wages dropped sharply.²⁷

Labour turnover was less frequent among direct production workers in the pipe section, most of whom held specific jobs that could not be found in other firms. In this section, direct production workers operated mechanical processes or oversaw chemical processes. Since each job involved a set of tasks and skills specific to that work position, these workers were less likely to leave the firm. Likewise, they could be replaced more easily as training time for these jobs generally ranged from three to six months.²⁸

Despite labour turnover, METASA could count upon a core stable labour force. By June 1987, 38 per cent of shop-floor employees had been in the firm for over five years, as shown in Table 6.2²⁹

Table 6.2: METASA: Seniority of Shop-floor Employees, June 1987

Number of Years in METASA	Number of Employees	% of Total Employees
< 2 years	160	37
2 to 5 years	108	25
5 to 10 years	98	22
10 to 20 years	54	13
> 20 years	14	3

Source: METASA: Human resources department, calculated from records used to determine seniority-based incentive pay

Seniority records by production section also indicated differences in labour stability between occupational categories, as shown in Table 6.3.

**Table 6.3: METASA: Maintenance Department and Pipe Section Seniority of Employees
June 1987**

Number of years in METASA	Maintenance Section		Pipe Section	
	Number of Employees	% of Total Employees	Number of Employees	% of Total Employees
< 2 years	62	66	27	45
2 to 5 years	14	15	8	13
5 to 10 years	12	13	15	25
10 to 20 years	6	6	7	12
> 20 years	0	0	3	5
Total	94	100	60	100
Unskilled auxiliary workers	15	16	23	38

Source: METASA: Human resources department, calculated from records used to determine seniority-based incentive pay

Table 6.3 includes unskilled auxiliary workers as a percentage of total employees because workers in this category were generally among those with less than two years in the factory. In comparison to the pipe section, a larger share of maintenance shop employees had been in the firm for under two years. Likewise, a smaller share of its employees were unskilled auxiliary workers. This indicates a higher degree of job instability among its mechanics, electricians and machine tool operators than among direct production workers in the pipe section. Nevertheless, both areas could count upon a group of senior workers with firm-specific knowledge and experience. In 1987, one out of four maintenance employees had worked in METASA for over five years. In the pipe section, just over 40 per cent had remained in the firm for this period.

In comparison to IMEP, METASA could count upon a larger stable labour force in 1984-87, a period characterised by a severe decline in real wages. About 46 per cent of those employed by

METASA in 1987 had been in the firm throughout this period, while an estimated 25 to 30 per cent had remained in IMEP.³⁰ Differences in employment growth partially explain why IMEP's stable labour force represented a smaller share of its total employees. In 1987, about 36 per cent of jobs in IMEP had been created since 1984, as compared to about 12 per cent in METASA.

Furthermore, alternative job opportunities in the same occupation were open to a larger share of workers in IMEP as compared to METASA. Welders, assemblers and machine tool operators comprised the major share of direct production workers in IMEP. They could utilise skills acquired in this firm to obtain more lucrative jobs in other enterprises, investment projects, or the informal sector. In METASA's pipe section and iron rod mill, direct production workers developed specific skills that could not readily be transferred to other firms or the informal sector. METASA faced skill constraints and job instability among mechanics, electricians and machine tool operators, who were key in keeping the pipe section in operation, and among structural welders and assemblers.

2.b. METASA's Response to Skill Constraints: In-house Training

METASA's ability to keep its plant in operation depended on the capacity of workers in key occupations to acquire new skills and train others through the traditional apprenticeship system, as well as through in-house technical training courses. Senior workers in the maintenance shop instructed newly-hired workers through the apprenticeship system, as described by César Blandón, an electrician with METASA since 1973.

Senior workers provided the best way of transmitting technical skills and experience from one generation to the next. For example, I learned from a senior worker, and when several others left, only he and I remained in the firm. We were then able to pass down our knowledge of the machinery to a new group of workers.³¹

Senior workers also taught technical courses for machine tool operators, industrial mechanics and electricians as part of a larger in-house training programme promoted by the union, management and the Ministry of Industry.³² Worker instructors first attended a teacher training course in METASA and received technical assistance from Ministry of Industry staff in

organising and writing up their lesson plans. They then gave two-hour classes to workers on a daily basis for periods ranging from two weeks to three months. In these courses, worker instructors conveyed specific information about the production processes in METASA and explained the technical principles behind them. The union promoted and participated in both these technical courses and adult education classes designed by the Ministry of Education. Like IMEP, METASA offered classes ranging from basic literacy up to the fourth grade of primary school. It also sent machine-tool operators to technical courses in the National Training System and in other metalworking firms. The latter were coordinated by the People's Industrial Corporation.³³

In sum, METASA's efforts to keep the pipe section in operation demanded skilled mechanics, electricians and machine-tool operators. The firm encountered difficulties contracting skilled workers in these occupations and also experienced high labour turnover rates. However, METASA could count upon a group of senior workers with considerable experience and specific knowledge about the plant. Senior workers played a crucial role in training newly-hired workers through the traditional apprenticeship system and technical classes.

3. In-house Training and the National Wage System

Part One has argued that both enterprises came under common pressure to train workers in-house and persuade them to remain within the firm. This led to changes in payment systems and corresponding social relations, which were distinct from those envisioned in the national wage system. By tying payment to the knowledge and skills required to carry out specific tasks, the national wage system intended to motivate individual workers to acquire additional skills through production experience and/or formal training. In practice, government-authorized wage adjustments remained far behind inflation rates, as discussed in Chapter Five. Workers were faced with two options. They could either leave the firm for the informal sector or better-paying investment projects, thereby aggravating skill constraints, or they could remain within the firm and press for incentive pay and social benefits.

In-house training represented part of the latter option. These initiatives could only be as

effective as each firm's efforts to persuade workers to remain within the firm. Each union promoted in-house training while drawing upon its increased bargaining strength to negotiate additional payment and incentive systems and social benefits. This represented a collective response aimed at simultaneously resolving skilled labour shortages and workers' economic problems. Chapter Seven will argue that both management and union developed cooperative participatory patterns of industrial relations under pressure to resolve this set of issues.

PART TWO: SHOP-FLOOR DECISION-MAKING

Part Two considers the degree of shop-floor decision-making and problem-solving capability required to carry out distinct types of productive adaptation. It also highlights the need for area supervisors to reorganise work constantly. It thereby attempts to document the role of shop-floor employees in ongoing processes of adjustment to changing production environments.

1. IMEP

1.a. Decision-Making on Labour Allocation

IMEP required a considerable degree of shop-floor decision-making regarding labour allocation, due to constant changes in labour supply, plant conditions and production requirements. The number and composition of workers changed significantly from day-to-day, leaving area supervisors to match the available labour force to production requirements on a daily basis. The firm did not lay off workers nor hire temporary labour so as to adjust employment to the current situation in the plant. To some degree, it could adjust to changes in the demand for unskilled workers merely through its hiring practices. It did not need to lay off workers as a number of unskilled workers left of their own accord in each production quarter. Moreover, it counted upon its skilled labour force to adjust to unexpected circumstances by moving between different tasks and jobs, and frequently working overtime.

Area supervisors assigned tasks according to the priority of work orders in process, product

quality requirements, and the capabilities of the available labour force. They had to allocate tasks among workers to meet quality standards, which varied significantly between different products. They also had to reorganise work continuously in the face of immediate skilled labour constraints, rush work on priority projects, variations in output mix, machinery breakdowns, electricity shutdowns, interruptions in input supplies and other circumstances.³⁴ According to shop-floor interviewees, workers frequently moved between jobs on different work orders. When the firm came under pressure to complete major contracts, workers shifted over to this priority project.³⁵

IMEP resorted to paid and unpaid overtime to meet major contracts and output targets, despite resource constraints. It utilised overtime to complete rush work on priority projects and to replace hours lost due to input shortages and/or electricity shutdowns.³⁶ Supervisors distributed overtime among workers while consulting with management on the total overtime fund available at any one point in time.

Management did not have adequate information by which to make or evaluate decisions regarding labour allocation. For example, the firm did not keep systematic records on programmed versus actual working hours and factors contributing to worker hours lost in each period. In addition, variations in product mix made it difficult to measure changes in output per worker. These information constraints reinforced the need for an effective form of shop-floor decision-making in the area of labour allocation.

1.b. Decision-Making on Production Issues and Worker Accountability

Entry into equipment production required a significant degree of shop-floor decision-making regarding raw material usage, equipment assembly and machine programming. A small group of workers initiated equipment construction by copying imported models. Minor product-oriented changes were conceived and carried out directly at shop-floor level. In 1984, IMEP

established a separate design section, thereby shifting decision-making to personnel in this office. However, shop-floor employees stressed that the design-based introduction of new products still called for considerable problem-solving in the cutting of parts to maximise material usage, and in equipment assembly.

Workers who were more adept at reading designs or conceiving of an effective way to assemble the equipment began to direct work in their area. Supervisors and equipment assemblers detected errors in design and carried out modifications in the course of production. In interviews, supervisors and equipment assemblers stated that design-related problems generally appeared during the production of the first units of new equipment. Because of the rate at which new products were introduced, equipment production continued to depend upon considerable problem-solving and decision-making capabilities at the shop-floor level. Likewise, IMEP maintained a broad product range in each period, involving hundreds of parts of varying sizes and shapes. This augmented shop-floor decision-making in areas such as raw-material usage and machine programming, as well as in equipment assembly.³⁷

IMEP faced a series of difficulties in attempting to establish an effective form of worker accountability. The firm gave priority to responding to immediate pressures from customers over improving performance in other areas. Under these circumstances, accountability for accumulated work-in-progress or delayed delivery dates could not be traced to any one group of shop-floor employees. A worker who was asked to change constantly between work orders could not be held accountable for meeting completion dates.

Under uncertain production conditions, these problems became more severe. There were difficulties in tracing worker accountability or pinpointing areas for improvement because the terms and conditions of work were constantly changing, and production results were influenced by factors outside the control of shop-floor employees. These problems could not be resolved through management-based information and control systems. Rather, IMEP attempted to resolve them through material and moral incentive systems and corresponding changes in shop-floor relations, as discussed in Chapter Seven.

In sum, IMEP required a significant degree of shop-floor decision-making so as to allocate labour effectively and carry out productive adaptation. Equipment and parts production

required considerable problem-solving by shop-floor employees in the areas of raw-material usage, equipment assembly and machine programming. Frequent changes in output mix reinforced this requirement. Under uncertain production conditions, shop-floor supervisors had to reorganise work constantly, seek ways to secure labour's cooperation, channel workers' initiatives in the productive sphere, and develop an effective form of worker accountability. This called for ongoing negotiations and consultation between workers, supervisors and management.

2. METASA

2.a. Decision-Making on Labour Allocation

METASA also required a considerable degree of shop-floor decision-making to allocate labour effectively and carry out productive adaptation. Instability of labour supply had two main implications in the pipe section. First, it led to immediate shortages of skilled mechanics, electricians and machine-tool operators, thereby affecting plant maintenance. Second, the pipe section constantly encountered the problem of how to replace workers temporarily in a continuous production process in which the work of others depended on them.³⁸

In an effort to resolve this latter problem, area supervisor, Manuel Mayorga, modified the apprenticeship system and, thus, the skill profile of some workers in the galvanization area. Traditionally, workers learned their job from senior operators at the same work position and were promoted progressively from unskilled auxiliary worker to operator and then through three skill levels at each work position. Opportunities for promotion were few because the number of skilled jobs were limited and were held by senior workers. In 1985, Mayorga taught one senior worker all the jobs in the plant, assigning this worker to any job that was left vacant temporarily. When more than one job became vacant, he was assigned to the most skilled job. At the same time, he and the area supervisor taught a group of unskilled auxiliary workers to carry out the other jobs. Although small in number, this group became an important reserve of workers with relevant skills as METASA attempted to adjust to constant changes in labour supply.

Area supervisors also had to reallocate labour in line with changes in production requirements and plant conditions, which required ongoing decision-making at shop-floor level. METASA did not lay off its employees or reduce working hours in the case of plant shutdowns. Rather, workers reported for work and were available to carry out odd jobs or general repair work. For example, workers in the galvanization area fabricated gearing chains and made fire clay bricks from scrap material, thereby substituting for imported items that could only be purchased with convertible currency. In some cases, workers would participate in equipment reconstruction or other measures required to get the plant operating again. When work was available, workers from the pipe section were transferred to the structures section. Area supervisors were responsible for efforts to maximise labour utilization under these circumstances.³⁹ Despite these efforts, plant shutdowns resulted in what Kornai has termed “unemployment on the job” as there was never sufficient work to employ the pipe section's entire labour force.⁴⁰

METASA generally did not hire temporary labour to meet major contracts and output targets, despite resource constraints. Instead it relied upon paid and unpaid overtime to complete rush work, overcome bottlenecks, and replace hours lost due to machinery breakdowns, electricity shutdowns, and/or interruptions in input supplies.⁴¹ Key groups of workers pushed for a lengthened working day to overcome immediate obstacles, while negotiating additional pay. These shop-floor initiatives in turn influenced the evolution of union-management relations, as discussed in Chapter Seven.

2.b. Decision-Making on Production Issues and Worker Accountability

Shop-floor employees had considerable control over the pace of production, which was determined by the speed with which workers carried out tasks, as well as the effectiveness of routine repair work. In the course of production, senior workers and supervisors had to improvise constantly due to machinery breakdowns and constraints on repair work such as shortages of imported machinery supplies. For example, the frequent wearing-down of

contacts was one of the main causes of downtime in the cold roll forming process. One operator stated, 'Five to ten times a day, we've got to stop the machinery due to technical failure or to change the contacts'.⁴²

Senior workers carried out mechanical repairs throughout the 1980-86 period. Yet, several factors contributed to the wearing-down of installed capacity in these years. These included skill constraints, inadequate information and feedback systems, the lack of preventive maintenance procedures, and an emphasis upon quantitative output increases over long-term maintenance. Under these circumstances, worker accountability for the maintenance of their machinery was very limited, even though they may have carried out mechanical repairs. By 1987, there were conflicts between production workers and the maintenance department over who should be in charge of this repair work. One worker, who had been with the firm for over twenty years, summed up this conflict:

Formerly we participated in repairs but now there are contradictions, because now only they [the maintenance shop] are authorised to repair the machinery. The operator is involved most directly in production and should be the one who knows his or her machine.⁴³

This conflict reflected tensions between uncertain production conditions and payment systems based on quantitative output indicators. When the machinery was down, workers lost incentive pay under the labour norm system. Senior workers argued that they had operated the same machine for years and therefore knew how to repair it. Mechanical processes were visual and could be observed by the worker. A number of repairs were minor and could be carried out quickly by workers and their immediate supervisor. The latter was in a good position to judge whether it would be necessary to solicit the services of the maintenance shop.⁴⁴

The maintenance department argued that they had skilled mechanics who were best-qualified to carry out this repair work. They added that workers would often carry out repairs so as to get the machines operating again, but that these were not necessarily in the interest of long-term maintenance.⁴⁵ Yet the emphasis upon quantitative output increases over maintenance work was general to the firm and had to do with the type of pressures and constraints under which it was operating. METASA's labour norm system merely reflected this tendency. By tying payment to quantitative output indicators, the labour norm system forced the firm to deal with

issues regarding the distribution of decision-making and responsibility for machinery care and plant conditions generally among its employees.

In sum, area supervisors redistributed tasks among workers in response to changes in labour supply and plant conditions. Likewise, senior workers and supervisors improvised constantly as they strove to keep the pipe section in operation under severe import constraints. As in the case of IMEP, supervisors had to reorganise work constantly, ensure labour's cooperation, and establish an effective form of worker accountability. In METASA, the labour norm system brought to the fore issues regarding the distribution of decision-making among shop-floor employees and administrative and technical staff, and intensified the need for ongoing negotiations and conflict resolution.

3. The National Wage System and Shop-floor Decision-Making in IMEP and METASA

To what degree did the national wage system limit the scope of shop-floor decision-making? In METASA's galvanization area, the supervisor wanted to apply one occupational category to all direct production workers, enabling them to rotate between the different jobs in the plant. He favoured job rotation as a way of overcoming immediate labour constraints, as well as reducing health risks associated with particular work positions. He was unable to implement this because of the different wage categories assigned to different jobs in the plant.⁴⁶ In this case, the national wage system did limit shop-floor decision-making to the detriment of production and labour. Otherwise, management and shop-floor employees in both enterprises negotiated changes in job and task allocation in relation to incentive pay, which represented an increasing share of workers' income in the 1984-87 period.

The national wage system was based on the principle that workers of the same occupational category should receive the same pay regardless of their employers' financial situation. In principle, this system was designed to provide some protection to workers against arbitrary management decisions in the assignment of tasks, jobs and wages. In practice, the guarantees offered by the national wage system became relatively insignificant as real wages declined

dramatically. While workers enjoyed job security, they faced a considerable degree of wage insecurity. However, workers could derive considerable bargaining strength from their role in production. Management and union were under pressure to resolve some of the most pressing economic problems facing workers' families, while simultaneously solving immediate production problems. Shop-floor employees negotiated issues regarding task and job allocation, as well as working hours, in this context.

In IMEP, management and the union jointly developed incentive systems that took into account the need for shop-floor decision-making, negotiation and conflict resolution in these areas. In METASA, workers earned incentive pay for each unit of output over the labour norm up to a set ceiling. Individual output levels depended on various factors outside the workers' immediate control such as the supply of vital inputs, the state of the machinery, and the effectiveness of maintenance and repair services. Tensions between uncertain production conditions and payment systems based on quantitative output indicators were heightened by the more severe impact of inflation on workers' real income. In both firms, management and the union developed participatory patterns of industrial relations under pressure to resolve these issues, as discussed in Chapter Seven.

CONCLUSION

Despite their distinct patterns of productive adaptation, IMEP and METASA came under common pressure to resolve two sets of issues in employment and the division of labour, particularly in the 1984-87 period. The first concerned the need to train workers in-house and persuade them to remain within the firm, while the second pertained to the persistent demand for shop-floor decision-making and problem-solving capabilities. Each firm encountered skill constraints on its ability to carry out specific aspects of productive adaptation. To overcome these limitations, both relied upon their traditional apprenticeship system and introduced technical training programmes within their factories. High labour turnover rates, associated with declining real wages, eroded their efforts to build up a skilled work force.

Each firm's adjustment processes required considerable problem-solving and decision-making

by shop-floor employees. Area supervisors had to reorganise work constantly in response to changes in labour supply, production requirements and plant conditions. In IMEP, equipment and parts production demanded problem-solving by shop-floor employees in the areas of raw material usage, equipment assembly and machine programming. Frequent changes in output mix reinforced this requirement. In METASA, senior workers and supervisors had to improvise continuously as they reconstructed old machinery, carried out maintenance and repair work, and implemented minor improvements to the production process under severe import constraints.

In comparison to METASA, IMEP came under greater pressure to resolve these issues for two reasons. First, IMEP's adjustment processes required a set of skills and problem-solving capabilities that were new to both its own workers and those available from external labour markets. With the exception of spare-parts production, the main adjustment processes in METASA's pipe section relied upon the firm-specific knowledge and experience of its senior workers. These workers taught others through the apprenticeship system and technical courses, while also guiding daily problem-solving efforts. Second, IMEP faced skill constraints and high turnover rates among welders, assemblers and machine tool operators, who represented the majority of direct production workers in the equipment and machining sections. In METASA, pressures to train workers in-house were concentrated among its maintenance workers.⁴⁷ Direct production workers in the pipe section were less likely to leave the firm and could be replaced more easily. Nevertheless, similarities in the issues confronting these enterprises and in the consequent pressures upon labour policy proved more significant than their differences.

Each firm moved to plant bargaining around social benefits and incentive pay under pressure to resolve these issues and adjust to external economic and political conditions. They thereby developed forms of remuneration and corresponding social relations distinct from those envisaged in the national wage system. In principle, the national wage system intended to motivate individual workers to acquire additional training by tying payment to the knowledge and skills required to carry out specific tasks. In practice, government wage policy contributed to high labour turnover rates and labour supply problems in both firms, thereby aggravating skill constraints. Each firm's union promoted in-house training to overcome immediate constraints, while drawing on labour's increased bargaining strength to negotiate incentive pay

and social benefits. This represented a collective response aimed at resolving skilled labour shortages and workers' economic problems simultaneously.

The national wage system was based on the principle that workers of the same occupational category should receive the same pay regardless of their place of employment. In principle, this system was designed to provide some protection to workers against arbitrary management decisions in the assignment of tasks, jobs and wages. In practice, workers faced severe wage insecurity in the inflationary period, thereby undermining guarantees included in the national wage system. In contrast, workers derived considerable bargaining strength from their role in production. Each firm's union negotiated issues regarding task and job allocation, working hours and corresponding pay directly on the shop floor.

IMEP designed its own incentive policies, while METASA implemented the labour norm system. In principle, this latter system was designed to stimulate increases in work intensity. In practice, the pace of production was determined by shop-floor problem-solving capacity, as well as by the speed with which workers carried out tasks. By tying payment to quantitative output indicators, the labour norm system could provide an additional incentive to workers to engage in perpetual problem-solving within the plant. However, this system could also disrupt production by provoking constant conflict around workers' pay under uncertain production conditions.

Chapter One drew upon studies of state socialist enterprises to design a framework for analysing the interaction between productive adaptation and union-management relations (Buroway and Lukács 1985, Galasi and Sziráczi 1985, Sabel and Stark 1982). Two insights from these studies proved particularly relevant in the Nicaraguan case. First, adaptation to supply uncertainty called for considerable shop-floor decision-making and problem-solving capabilities. Productive adaptation (viewed in light of supply, demand and financial conditions) generated similar requirements in the Nicaraguan case.

Second, workers in state socialist enterprises derived considerable bargaining strength from tight labour market conditions, plus their role in adjusting to uncertain production conditions. Pressures to overcome skill constraints under tight labour market conditions could be expected to enhance labour's bargaining position in the Nicaraguan case. Likewise, workers were likely

to derive bargaining strength from management's dependence upon both their ability and willingness to adjust to changing production conditions and the capacity of area supervisors to organise this process. Chapter Seven will consider these latter points in the context of plant bargaining around social benefits and incentive pay.

Sable and Stark (1982) emphasised management's dependence upon workers to meet output targets under uncertain conditions. In the Nicaraguan case, workers became increasingly dependent upon their workplace to resolve their economic difficulties under crisis conditions. Chapter Seven will argue that an interdependence between the two sides propelled the development of cooperative participatory relations within each firm. This did not occur automatically but rather resulted from the particular strategies adopted by these unions.

NOTES

¹ Prior to carrying out the interviews, I reviewed existing records in the production, human resources and financial departments. Often, these records did provide useful information which could be explored further in the interviews. However, this information was available only over limited periods and therefore could not indicate changes over time.

² IMEP, Interview no. 1 (July 1987), Julio Valladares, director (1985-87); Interview no. 28 (August 1987), Manuel Gómez, human resources department director (1985-87); and Interview no. 29 (July 1987), Eligio Chávez, union secretary general (1984-87).

IMEP only kept figures on absenteeism during very limited time periods and in specific sections of the plant.

³ In 1985-86, manufacturing firms were occasionally allowed to postpone the mobilization of skilled workers until they could be replaced. Military service had the most severe impact on production in 1987, when postponement was no longer permitted.

⁴ IMEP, Interview no.1 (October 1987), Valladares; Interview no.28 (August 1987), Gómez; Interview no.29 (October 1987), Chávez; and Interviews no.7 (October 1987), with workers in each phase of the production process, cutting and bending section and equipment section.

⁵ IMEP, Interview no.1 (October 1987), Valladares; Interview no.4 (September 1987), Noel García, production department director (1987); Interview no.6 (October 1987), Jesús Tercero, maintenance department director (1983-87); and Interview no.30 (September 1987), Luis Corea, production manager, machining section (1984-87).

⁶ IMEP, Interview no.8 (July 1987), Herzán García, director (1980-85).

⁷ Payrolls for July-December 1987 were unavailable due to the reorganisation of this department.

⁸ IMEP, Interview no.31 (October 1987), German Prado, equipment assembler and head of the innovators' movement for the metalworking industry.

⁹ IMEP, Interview no.1 (July 1987), Valladares; Interview no.29 (July 1987), Chávez; Interviews no.7 (September 1987); and Interviews no.15 (September 1987), with workers in the machining section.

¹⁰ IMEP, based on figures compiled by the human resources department.

IMEP also granted authorised leave to workers participating in technical courses and political seminars, as well as in cases of illness.

¹¹ Because the vast majority of interviewees in IMEP mentioned skilled labour shortages, a separate reference to each interview will not be made here.

¹² See Chapter Four, Tables 4.4, 4.6, and 4.7.

¹³ See Chapter Four, Chart 4.1.

¹⁴ IMEP, based on monthly figures compiled by the human resources department.

¹⁵ IMEP, Interview no.28 (August 1987), Gómez.

16 Ibid.

17 IMEP, Interview no.16 (September 1987), Camilo Murillo, area supervisor, equipment section.

18 IMEP, Interview no.30 (September 1987), Corea.

19 IMEP, Interview no.1 (October 1987), Valladares; Interview no.2 (September 1987), Victor Thomas, production department director (1983-86) and technical department director (1986); Interview no.3 (October 1987), Ricardo Barbieri, technical department director (1987); Interviews no.11 (September, October 1987), technical department staff, including foreign technical advisors; and Interview no.29 (October 1987), Chávez.

Interviewees highlighted these training courses when describing the process by which IMEP introduced new products and technical processes.

20 Ibid.

21 Interview no.28 (August 1987), Gómez.

22 IMEP, Interviews no.7 (October 1987); Interviews no.11 (September, October 1987); and Interviews no.15 (October 1987).

23 IMEP, Interview no.1 (October 1987), Valladares.

24 METASA, Interview no.18 (June 1987), Herzán García, director (1985-87); Interview no.22 (April 1988), Milton Icaza, technical department director; Interview no.24 (May 1988), Agustín Vaughn, maintenance department director (1987); and Interview no.32 (June 1987), César Blandón, electrician and member of the union executive committee.

25 It is also unclear whether these figures include workers who were in the firm only for days or weeks. These figures should be seen as rough estimates as the method used to calculate them may have changed over time due to changes in personnel within the human resources department.

26 There were also high labour turnover rates among structural welders and assemblers. Although the case studies focused upon the pipe section, Chapter Seven will also refer to events within the structures section to the extent that these influenced the evolution of union-management relations.

27 METASA, Interview no. 18 (June 1987), García; Interview no.22 (April 1988), Icaza; Interview no. 24 (May 1988), Vaughn; and Interview no. 32 (June 1987), Blandón.

28 METASA, Interview no.18 (June 1987), García; Interview no.25 (April 1988), Manuel Mayora, galvanization area supervisor, and Interviews no.21 and 26 (May 1988), with workers in each phase of the cold roll forming and galvanization processes respectively.

29 METASA, calculated from records used to determine seniority-based incentive pay as of June 1987, plus list of employees in each production section.

30 IMEP and METASA, calculated from records used to determine seniority-based incentive pay as of June 1987, plus list of employees by production section in METASA and Interview no.1 (October 1987), Valladares.

31 METASA, Interview no.32 (June 1987), Blandón.

³² This programme also included courses for structural welders and assemblers.

³³ METASA, Interview no.18 (June 1987), García; Interview no.32 (June 1987), Blandón; Interview no.33 (May 1988), Gonzalo Mendoza, union secretary general (1987), and Interview no.34 (February 1988), Pablo Hernández, union secretary general (1986).

³⁴ IMEP, Interview no.9 (September 1987), Carlos Castro, area supervisor, cutting and bending section (1980-87); Interview no.16 (September 1987), Murillo; and Interview no.30 (September 1987), Corea.

³⁵ Interviews no.7 (October 1987).

Based on company records, we could not measure the frequency with which workers changed tasks or jobs, or moved between work orders.

³⁶ IMEP, based on figures compiled by the human resources department; and Interview no.1 (July 1987), Valladares and Interview no. 28 (August 1987), Gómez.

IMEP did not keep figures on overtime as a percentage of hours worked in different periods. Overtime represented between 7 and 14 per cent of the total wage fund in each production quarter from 1984 to 1987, according to figures compiled by the human resources department. These figures understate the extent to which IMEP relied upon overtime as the total includes incentives, bonus pay, vacation pay, and payment by contract, in addition to basic wages.

³⁷ IMEP, Interview no.9 (September 1987), Castro; Interview no.16 (September 1987), Murillo; Interview no.30 (September 1987), Corea; Interview no.31 (October 1987), Prado; and Interviews no. 7.

³⁸ METASA, Interview no.25 (April 1988), Mayorga.

³⁹ Ibid.

⁴⁰ See Kornai (1980), p.254-257.

⁴¹ Figures on the share of overtime in total worker hours, or as a percentage of the total wage fund, were not available in METASA.

⁴² METASA, Interviews no.21 (May 1988).

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ METASA, Interviews no.21 (May 1988); and Interview no. 24 (May 1988), Vaughn.

⁴⁶ METASA, Interview no.25 (April 1988), Mayorga.

⁴⁷ This comparison refers to workers involved in the pipe section in METASA and in agricultural and equipment parts production in IMEP. Both firms also trained structural welders and assemblers.