the major automakers served as the pacesetters and submitted their demands to management on February 10. Seventeen firm-level unions under the umbrella of Denki Rengo (the Japanese Confederation of Electrical Electronic and Information Unions) then presented their demands by February 18.

Virtually every company is struggling in the second consecutive year of negative growth. Under this situation, focus is on whether labor will be able to counter management's position that there is no margin for wage hikes. Labor and management will likely be forced to face the toughest pay negotiations ever. March 17 was the date of reply set for management by Kinzoku Rokyo (IMF-JC). Individual unions have initially stuck with Rengo's demand for a wage hike over one percent excluding the regular two-percent annual pay increase. To put wage disparities between companies into perspective, an increasing number of industrial-level unions have adopted the system of linking wage demands for individual workers to an across-the-board figure rather than going for an overall increase in percentage terms. Jidosha Soren (Confederation of Japan Automobile Workers Unions) will for the first time ask that the average pay raise for a 35-year-old worker (with 17 years of service, a high school diploma and a skilled position) be increased from ¥306,300 to ¥309,800. In terms of the old average demand system, it will demand an overall increase of ¥9,000 (including the regular annual pay increase), down ¥4,000 from ¥13,000 the year before.

As for bonuses, the union at Toyota Motors, the nation's largest in the auto industry, demanded bonuses equivalent to six months of the basic wage, 0.1 month below the amount won the previous year. Meanwhile, the union at Honda, which is expected to post record profits, asked for bonuses equivalent to 6.3 months of the basic wage, 0.1 month higher than the amount agreed upon last year.

Labor unions at the major electric machinery makers asked for a wage hike of ¥3,000, excluding the regular annual pay increase, for employees 35 or older who had graduated from high school and had been on the job for 17 years. This year, Denki Rengo shifted to concluding an annual agreement under which summer and winter bonuses would be determined during the spring wage talks. Kanto-based companies such as Hitachi demanded bonuses which will be equivalent to 5.1 months of the basic wage, while Kansai-based companies such as Matsushita Electric requested bonuses equivalent to 5.0 months of the basic wage. However, several companies have developed a formula-driven approach which ties bonuses to corporate performance, instead of the system of negotiating the average bonuses as a multiple of the monthly base wage. For instance, four unions — including those at Fujitsu, Toshiba and NEC —did not demand summer and winter bonuses.

Another development during this year's spring wage offensive was the request by Zosenjuki Roren (Japan Confederation of Shipbuilding and Engineering Workers Unions) that the mandatory retirement age be extended, responding to raising the age when employees become eligible for their pension from 2001.

PUBLIC POLICY

Unemployment Benefits Rolls Top One Million for First Time

The number eligible for unemployment benefits in 1998 averaged 1.2 million, topping the one-million mark for the first time since 1949, the first year for which the valid statistical data is available. The unemployment benefits enable jobless people who are actively seeking re-employment to receive 60 percent to 80 percent of the wages they earned before being unemployed up to 300 days. The number of days for which the benefits will be paid is determined by the number of years for which the individual was employed. The rise in the jobless rate since spring of 1998 has been accompanied by a rapid increase in the number of people receiving benefits. The number stood at 1.04 million in June 1998, and remained over the one million mark through December. The average number eligible for benefits in 1998 surpassed one million on an annual basis and was about 150,000 above the figure for 1997.

The number eligible for first-time unemployment benefits has also increased rapidly over the past two years. The number rose 10.3 percent in 1997 and 19.6 percent in 1998. These dramatic increases are evidence of the extent to which the employment situation has deteriorated.

The worsening employment situation has been characterized by the fact that restructuring has forced a disproportionately large number of middle-aged and elderly people to lose their jobs. Their relatively high wages before being out of work and their long period of

employment has increased the per capita outlay required for unemployment benefits. In 1998, the per capita benefit was ¥150,000 a month. That represented an increase of about ¥40,000 over the amount paid 10 years earlier.

Unemployment benefits are covered by contributions paid by workers and employers (each paying an amount equivalent to 0.8 percent of the employee's wages) as well as by a subsidy from the National Treasury (representing about 14 percent). Those who paid unemployment insurance premiums began to decrease in the summer of 1998. Moreover, wages, particularly overtime pay, have also fallen in recent years. The Ministry of Labour, which operates the unemployment benefit scheme, predicts that premium revenues will fall slightly in 1999 and beyond. The unemployment system ran a deficit of over ¥900 billion in 1998 alone. If this situation continues there will be major problems and steps will have to be taken to cope with it. Either the rate of insurance premiums must be increased or the rate of the subsidy from the National Treasury must be raised.

Special Topic

The Toyota Production System in Indonesia

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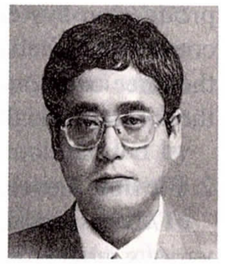

This paper aims to examine to what extent the Toyota Production System (TPS) has been rooted in Indonesia, by applying the work organization approach and utilizing the data supplied by Toyota-Astra Motor (TAM), a joint venture operating in Indonesia for about 30 years[1]. The paper first explains briefly the analytical framework used, and then describes how flexible and leveled production runs. It goes on to discuss the work organization in a Trim Line and some characteristics of Human Resources Management (HRM) policies. Through the analysis the paper shows how well the TPS functions at TAM.

1. The Work Organization Approach

The work organization approach focuses on the production management system, work organization and HRM.

Central to the analysis is the work organization, which is compounded of a cluster of inter-related jobs and of a group of workers who are allocated into the job cluster. In line with the STS (Socio Technical Systems) approach[2], there is choice in organizing tasks into a job and organizing jobs into a job cluster. There is also choice in forming job ladders. The term "work organization" here does not cover a plant or a firm as a whole, but only covers the shop-floor[3].

The work organization requires environmental disturbances to be controlled in order to successfully execute conversion process from inputs to outputs (Thompson 1967). Production management system is one of the systems that protect the work organization from various environmental disturbances. "Production management" in a narrow sense refers to the functions involved in planning, organizing and controlling production to reduce costs. It includes process control, quality control, work study, carriage control, inventory control (Tasugi and Mori 1956).

The design of production management system affects the way in which tasks and jobs are designed and thereby the work organization design. For example, when cost reduction tasks and quality control tasks are partially entrusted to the shop-floor under a production management system, jobs are enriched and workers are encouraged to develop the capabilities of executing the control tasks. The work organization also affects the way how production management system is designed.

The success with which the work organization functions well will also be influenced by another control system, that is, HRM, especially the way the remuneration system and training are structured. As an important component of the work organization, workers should be given appropriate monetary incentives and appropriate training.

When the work organization is properly aligned with the production management system and the HRM system, the production system as a whole functions well. The three components of the production system are influenced by various external factor markets and by the state of labor management relations.

The above defined framework is useful when doing research on the transfer of technology. When Japanese firms establish a plant abroad, their production management systems can be transplanted relatively easily along with the requisite equipment. Their design is determined primarily by a body of universal scientific and technological knowledge and are not bound to a particular location. However, the other two elements are much more difficult to transplant. Work organization models and the HRM models are generally the product of unique historical settings and usually need to be adjusted to factor markets conditions and the industrial relations system prevalent to each country. The two components of the production system, therefore, must often be newly constructed or changed, so that the consistency among the three components can be attained[4]. The creation of these systems is the process of technology transfer.

2. Flexible Leveled Production

TAM assembles various types of single model or various models in a mixed way on the same assembly line. Suppose that four types of "Kijang" (TAM's best selling commercial car in Indonesia)—the Grand Luxury, the Deluxe, the Standard and the Diesel—are produced with the ratio of the first three types standing at 2/7 and the ratio of the last type standing at 1/7. At TAM these four types are all assembled in a mixed way on the same assembly line, with the production sequence being kept constant. TAM uses the same system to produce three passenger car models—the Corolla, the Starlet, and the Corona.

In either case, the mixed production line produces each type or model regularly to a set production sequence. Every seven units of the Kijang coming off the line includes two Grand Luxury vehicles, two Deluxe vehicles, two Standard vehicles, and one Diesel vehicle. The mixed production system with a constant production sequence is called "Leveled Production" in TPS terminology (TMC 1995, 13).

Different models require different parts and there are different methods of assembly with different jigs and tools. This situation can exist even in the production of different types of the same model. Frequently changing models and types coming through on the assembly line requires time to allow for the change of parts, jigs and tools. Hence, a poorly considered mix of vehicles may result in various types of inefficiencies. Since assembly time varies from one type of vehicle to another even when the model is the same, it is very difficult to assemble different models and types on the same assembly line with the conveyor speed remaining constant. The leveled production system solves these problems.

Takt time and cycle time are critical to leveled production. Takt time refers to conveyor speed. A finished vehicle is completed every takt time. Cycle time refers to the time necessary for a worker to finish one cycle of his job with one automobile. The length of cycle time depends on how many tasks are included in a worker's job. On the assembly line every worker completes his job in the same cycle time. Otherwise, production would not proceed steadily.

Before flexible production is set up, the takt time and the cycle time must be determined according to the monthly production volume. Table 1 provides information on production targets for three vehicles which are to be assembled over a month with 20 working days and eight-hour shifts. In the discussion below, night shifts are excluded from consideration.

Table 1. Monthly Production Volume

Model	Monthly production volume	Ratio of manufacturing time
Corona	100 units	12
Corolla	500 units	11
Starlet	100 units	9

Note: The Corona takes the longest time to assemble, the Corolla the second longest, and the Starlet takes the shortest. The figures presented here for the production volume, takt time, and cycle time are not actual figures, but have been devised to facilitate the explanation.

Takt time is calculated by dividing the total number of effective operating minutes by the planned production volume. Total effective operating minutes per day might be calculated as follows: 480 minutes (8 hours) minus 25 minutes of relief time plus 60 minutes of over time equals 515 minutes. Total monthly production volume of 700 units divided by 20 working days equals to 35 units per day. The takt time is about 15 minutes (=515 minutes ÷ 35 units).

The cycle time for each model is worked out by using the above determined takt time. Suppose that the takt time is applied to the production of the Corolla. In other words, each job with a Corolla is designed so that the cycle time is equal to the takt time. The conveyor speed allows each station on the assembly line 15 minutes, during which a worker completes his work for one unit of the Corolla. The ratios of manufacturing time in Table 1 show that every worker requires more time to complete one cycle of his job with the Corona, and less time with the Starlet. The cycle time for the Corona becomes 16.36 minutes (=15 minutes × 12/11), while that for the Starlet is 12.27 minutes (=15 minutes × 9/11). With a 15 minute takt time, production of the Corona would cause many line stops due to a lack of time to complete the job. While with the Starlet, every worker would have some waiting time.

In order to solve the problems stemming from building multiple models on the same assembly line, the sequence of production must be considered as well. In this illustration, the production sequence should be determined as CCCCCCSN (where C stands for Corolla, S for Starlet, and N for Corona). After finishing five Corolla units, workers assemble one Starlet. It takes the worker 12.27 minutes to complete his work, leaving him with 2.73 minutes of idle time (=15–12.27). When the worker starts to assemble a Corona after finishing the Starlet, he has 17.73 minutes (=2.73+15) to complete his job on the Corona. Since the cycle time for the Corona is 16.36 minutes, the 17.73 minutes is enough time for the worker to complete his job. Only 1.37 minutes of waiting time is yielded during one round of the production sequence (producing seven vehicles), providing there are no line stops.

Since takt time is calculated from planned production volume and total effective operating hours, in case of a large change in production volume takt time is also changed. A striking feature of the TPS is the ability to change takt time in order to adjust to market fluctuations.

Let us examine the example of passenger cars again. Were monthly production volume of the Corona reduced from 100 units to 80 units, the Corolla, from 500 units to 300 units, and the Starlet, from 100 units to 80 units, takt time would be 22.4 minutes (515 minutes/ [460 units/20 days]). The cycle time of the Corolla is, then, equalized to the new takt time. The cycle time for the Corona becomes 24.4 minutes. For the Starlet it becomes 18.3 minutes.

The length of the cycle time depends on how many tasks are included in a job. When cycle time is lengthened, more tasks are added to each job. As more tasks are added to jobs, the number of workers required to staff the assembly line decreases, since the total number of tasks on the assembly line is constant. How does TAM reduce excess workers? The first course of action is to dismiss contract workers who are hired on a temporary basis. After that, some workers are removed from assembly operations and reassigned to other assembly lines or placed on task force teams in order to facilitate continuous improvement activities. If these measures are inadequate, some regular workers will be temporarily laid off or dismissed. When there is a large increase in production volume, the reverse occurs. Takt time and cycle time are shortened (i.e. the assembly line speed is increased). Every worker's job is reorganized, reducing the number of tasks and new contract or permanent workers are hired.

The ability to flexibly adjust takt time enables TAM to produce according to fluctuations in the market without excessive inventory in any form and to fully utilize its human resources. Change in takt time is not easy to execute, since it is accompanied by change in cycle time and reorganization of each worker's job. Moreover, it takes workers a while to adjust to the changed cycle time and reorganized jobs.

Both flexible production at TMC (as described in TMC 1995, 22; in Monden 1985, 210-212, 218-220; in Monden 1991, 142) and flexible leveled production at TAM are built on the same basic principles.

3. Work Organization

3.1 A Trim Line

By using the Kijang Trim Line as an example, the following discussion considers the work organization that enables the flexible leveled production system to work at TAM. A Trim Line is an assembly line where various parts are assembled into a car body. A glance at the assembly line gives one the impression that workers are engaged in monotonous, hard jobs without much time for rest. The Kijang Trim Line assembles 22 types of Kijang and is run by a supervisor, four foremen, 12 group leaders, and 80 operators.

3.2 Daily Work of the Operators

Operators in the Trim Line at TAM are required to perform repetitive work within the takt time strictly following the work sheets and standard operation procedure. They are expected to follow directions exactly as prescribed in a pre-determined way. When a problems happens, they are to call their group leaders immediately. While the group leader attends to the problem, the worker may engage in other tasks or may watch the group leader fix the problem. These findings do not suggest that operators in the Trim Line at TAM work voluntarily and creatively. However, the workers handle many different types of the Kijang vehicle as they come down the line, and the variety requires them to be very careful in order to ensure high quality work when performing their jobs.

Furthermore, the operators are trained as multifunctional operators through rotation. The term "multifunctional" in the Trim Line means that an operator is able to perform more than one assembly job. For example, a worker can assemble window regulators into doors and also install side glass into doors. About 20 percent of the 32 operators in the Trim Line can perform two jobs; 15 percent, three jobs; and about 10 percent, four jobs. These figures might underestimate the percentage of multifunctional operators, because the Trim Line was just reorganized and the verifying test was not completed yet when this research was conducted. Figures for the Chassis Line suggest that the number of multifunctional operators is much greater.

Multifunctional operators are one requirement for the flexible leveled production and the TPS at TAM. Takt time at TAM varies according to production levels. A change in the takt time results in each job being reorganized. Reorganization is not just for some jobs; it occurs for all jobs. With multifunctional operators changes in takt are much easier to implement, since the reorganization can be done without being obstructed by the limits of operators' job capability, or with less training.

3.3 Group Leaders[5]

The Trim Line has 12 group leaders, with each supervising seven to eight operators. Group leaders perform multiple roles on the shop floor: they prepare for production, relieve operators, solve problems on the spot, and engage in quality control and labor management functions. Relief, problem-solving and quality control roles are described below.

When an operator needs relief from his operation, a group leader takes his job. Another group leader or a foreman then fills in for the group leader. Hence, group leaders must be able to perform all the jobs under their supervision.

When an operator discovers a problem during the assembly process, he is supposed to pull a "line stop cord" to call his group leader. The group leader responds immediately to fix the problem without stopping the line. If the leader cannot fix the problem within the cycle time, he stops the line. Problems can arise when an operator assembles the wrong parts, forgets to install parts, uses the wrong bolts or other fasteners, or the quality of parts is unacceptable. Also when an operator has difficulty finishing his job within the cycle time, a line stop occurs.

Two points are important. First, problems do not always mean line stops. Group leaders try hard to avoid line stops. Targets are set for line stop time. For example, they may be 20 minutes per day per supervisor, seven minutes per day per foreman and two minutes per day per group leader. Group leaders are thus encouraged to fix problems within the cycle time as often as possible. Second, group leaders have to be able to perform every job in their area. Otherwise, they could not fix problems effectively. While group leaders fix many problems by themselves, there are some problems that cause line stops and the group leaders need assistance in order to correct them. When such problems arise, group leaders report to their foreman and ask for further instructions.

Every hour the group leader goes to the final inspection line to check whether defects have occurred in their area. The inspectors display tables showing the types and number of defects produced in each group leader's area. When the same defect is rediscovered on the final inspection line in two or three units in a row, the information about the defect is immediately conveyed to the group leader. The group leader can then go to the operator responsible for the defect and search for the cause. Characteristic of these quality control activities is the quickness with which group leaders are notified and the focus on handling problems and defects that have already occurred.

While these activities constitute a portion of the quality control process, other activities are also used in order to "build in quality in the production process". To assure that high quality is produced, the occurrence of defects must be prevented. Group leaders are

responsible for keeping records of line stops and defects. They usually draw graphs pictorially illustrating the performance of their area. The records and graphs are utilized in other quality related activities, which activities are discussed below.

3.4 Quality Control Activities

After each production shift, a quality meeting is held daily for 30 minutes to deal with problems that were encountered that day. A group leader and his operators attend the meeting, supervised by a foreman. Several features of these meetings are important. First, the meeting gives operators an opportunity everyday to think about the nature of their problems and to consider possible solutions. Second, the meeting considers concrete issues that relate directly to problems of production. Third, some operators are more actively involved in solving problems than others. Multifunctional operators may be more active because they know many jobs and they tend to have more experience with solving problems.

Operators spend almost all of their time on repetitive, physically hard assembly work, and the 30 minutes they spend on problem solving may not appear to be enough time to make significant contributions to the smooth and efficient running of the assembly line. However, the workers do come up with devices that error-proof their processes so that problems do not reoccur. Furthermore, these meetings are closely tied into an idea suggestion plan.

Two kinds of preventive measures are proposed at the daily quality meeting. One is to revise the way of performing jobs, the location of parts and the jigs and tools used, and to add other instruments. The other does not need such revision. In the latter case, operators who are found to have caused problems are given advice on how to more strictly follow the standard work sheet and standard operation procedure. The former type of measure is usually thought out and submitted as a written suggestion.

An operator who comes up with a concrete idea shares it with his foreman and asks for his opinion and advice. After approval by the foremen, the operator fills out a suggestion form. When filling out the form, one is expected to explain the problem, analyze its cost, depict its current condition, suggest an improvement, explain new method and/or new process, and evaluate the result of improvement suggestion using data and cost analysis.

The work of suggesting an idea does not seem easy. It requires a different set of skills from the physical skills that are normally associated with production work. Workers must have intellectual capability to solve problems effectively and to submit suggestions that improve the process. In 1997, an operator or a group leader submitted about eight suggestions per month on average.

Some problems recur again and again even though ideas to solve them have been suggested and implemented. Other problems take a long time to solve. When these types of problems arise, quality circles (QCs) attempt to bring resolution to these difficult issues. A QC at TAM is usually organized with seven to ten members and is headed by a group leader. There are about 320 QCs throughout the plants at TAM in 1997 and almost all of the workers participate in QCs. QCs are expected to have a meeting for one and a half hour every Tuesday after the end of the shift. In reality, how often QCs hold meetings is left to the members. Some QCs hold a meeting every week while others meet less often up to once a month.

A QC consists of a circle leader, a theme leader, a facilitator and members. An engineer is not formally involved in a QC formally and in fact, a QC seldom ask for an engineer's support. The QC leader is a group leader and the facilitator is a foreman. A theme leader is an operator whose job is subject to the improvements being considered. The theme leader actually leads the QC, because he knows the situation best. Other multifunctional operators including a group leader may be active since they too will be familiar with the problem.

Between 1996 and 1997 five QCs in the Trim Line actively tackled difficult problems and produced remarkable results. They reduced the defect rate from 0.02 to 0.006 percent in one instance; and from 0.3 to 0.09 percent, from 0.23 to 0.05 percent, from 0.042 to 0.005 percent in three others; the fifth QC obtained a reduction in the number of broken parts per week from 77 to 2.

3.5 Change in Takt Time

Takt time is usually changed several times a year at TAM, following a large change in the volume of production and when a new model is introduced.

Among the takt time change procedure, job reorganization is the most difficult and requires most of energy necessary for the procedure. Job reorganization proceeds as follows. First, a group leader arranges all the job tasks under his supervision. The time necessary to complete each task is pre-determined with standard time data. The group leader, together with his foreman, combines the tasks into jobs with ensuring a smooth production flow. He also determines the sequence of assembling parts, so that cycle time of each job will be equal to the takt time. Because TAM assembles various types or models in the Trim Line, the group leader has to reorganize jobs many times to accommodate the different types of vehicles assembled. With some types of vehicles, the cycle time of each job may exceed the takt time. With other types, the cycle time may fall below the takt time.

Reorganizing all jobs so that cycle time is equal to takt time (or takt time plus seconds or takt time minus seconds) is not easy. In practice some of the reorganized jobs take more time than pre-determined cycle time during the trial stage. When the reorganization of some jobs is discovered to be technically impossible, improvements become necessary. Improvements are devised on the layout of equipment, parts rack, jigs and tools as well as the way the work is performed.

A group leader performs the reorganized jobs to see whether the cycle time is equal to takt time (takt time plus or minus seconds) . If the test succeeds, he draws up standard work sheets and submits them to his foreman. The foreman examines them and makes some modifications on them. When the foreman approves the standard work sheets, the takt time change procedure finishes.

After the takt time change is fully implemented, a further search for better quality and higher productivity begins. Let us examine this process using the launch of the new Kijang, at the beginning of 1997, as an example.

During the initial stage of process design, the production engineering division calculated takt time to be 2.9 minutes. However, this target proved to be difficult to attain. Thus, production started at a takt time of 3.2 minutes. After launching the production of the new Kijang, takt time shortened from the initial 3.2 minutes to the planned 2.9 minutes. Takt time was further reduced to 2.55 minutes. How was this accomplished?

Takt time was shortened as a result of the continuous improvement activities that were conducted by operators, group leaders and foremen at the daily quality meeting, through idea suggestions and QCs. The way jobs were performed was checked everyday and some tasks in some jobs were moved to other jobs. Some jobs were modified when excessive walking was discovered and subsequently removed. Other jobs were changed when parts racks were relocated closer to assembly line or special drawers for jigs and tools were devised. These small step-by-step improvements took place while the operators were getting used to their new jobs. The result was a 20.3 percent reduction in takt time compared with the actual start up takt time and a final outcome, and 12.1 percent below the targeted takt time calculated by the production engineering division.

3.6 Career

There are two kinds of supervisors and foremen. University graduates and academy graduates are promoted to be supervisors after joining TAM and finishing one year of training. High school and junior high school graduates are promoted to be supervisors and foremen from within. According to a deputy general manager, however, almost all of the supervisors and foremen had high school degrees. Group leaders are also promoted from within the organization. In the Trim Line, on average, a group leader who finished high school (junior high school) worked as an operator at TAM for 11 (14) years and has an experience in the Trim Line of 8 (11) years before promotion.

The more impressive fact is the variety in their careers. Among the group leaders with a high school degree, one was promoted to be a group leader in four years, while it took 20 years for another to be promoted. The fact suggests that promotion to group leader is not based simply on the length of service. It does not mean that the experience is not necessary. Experience is surely the most important requirement for promotion to group leader. The point is that promotion seems to be based on evaluation on job capability and that the competition is fierce.

3.7 Flexible Leveled Production and Work Organization

Flexible leveled production with assuring high quality is supported by a group of operators and group leaders. While operators repeatedly assemble parts into a car body closely following the work sheets and standard operation procedure and keeping takt time during daily production, they also engage in production control tasks at the daily quality meeting, through the idea suggestion plan and QCs. Group leaders, promoted from among operators, are responsible for daily trouble shooting, and also play an important role when the takt time is changed and jobs are reorganized. Operators and group leaders, together with foremen, implement many kinds of improvements to ensure a smooth launch of the production with new takt time.

4. HRM and Work Organization

4.1 Remuneration

The base wages are not directly connected to jobs. This allows for frequent job rotation and flexible reorganization of jobs, and thereby increases the flexibility of the work organization. The basic wages are determined according to wage grades and steps within a grade in which workers are ranked. Upgrading is closely related with promotion in position, but the both are not identical. Even if a worker gets no promotion through his career, he is upgraded at least by one grade and his basic wages are to be raised little by little every year according to the length of service. The "seniority-based wages" may reflect overall improvements in each worker's skill over time. The wage system is similar to that used by Toyota in Japan.

The age-wage profile is much steeper and the wage differentials among the wage grades are much larger at TAM than at Toyota in Japan. This provides Indonesian workers with strong incentives for upgrading and promotion. Both of them depend on the performance evaluation a worker receives. It is through the performance evaluation process that workers are motivated to improve their job capability. This system motivates workers to participate in job rotation, the suggestion plan, QCs, and even off the job training. This strong incentive is a product of TAM, and perhaps reflects the peculiarities of Indonesia's labor market.

4.2 Training

Operators learn skills from their daily operations through rotation, by participating in the suggestion plan and by attending QCs. Training programs for group leaders and foremen are numerous and very substantial. All of the classes for them have been imported from Toyota in Japan, with some modifications. Some of the programs give group leaders and foremen opportunities to systematize knowledge and experience and to brush up their skills.

It should be noted that the instructors for these classes are TAM personnel and that they instruct the classes in Indonesian language. Taught by internal instructors, these classes provide the basis for group leaders and foremen to get a much better understanding of the TPS and production control techniques.

Notes:

1. Data used in this paper is compiled from Nakamura and Wicaksono (1999). For information about the book, please contact to the Center for Japanese Studies, University of Indonesia. The e-mail address is: nippon@idola.net.id.
2. For details on the STS approach, refer to Emery and Trist (1960), Trist, Higgin, Murray and Pollock (1963), Cummings and Srivastva (1977).
3. It is assumed that the work organizations at the shop-floor are organized in an almost similar way throughout a plant or a firm.
4. Using an analytical framework similar to the work organization approach developed here, though the framework is not explicitly developed, Oh (1999) analyzes the characteristics and limitations of the Japanese production model in two Korean automobile firms.
5. Foremen's daily work is not analyzed here. For the details, refer to Nakamura and Wicaksono (1999).

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