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Résumé de l'article

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The Canadair-I.A.M. Productivity Improvement Plan

David A. Peach

This paper presents the experience of Canadair-I.A.M. Productivity Improvement Plan.

Canadair, Ltd., of Montreal, and Lodge 712 of the International Association of Machinists and Aerospace Workers, representing the Company's production and maintenance employees, first negotiated a Productivity Improvement Plan in 1968. Over the years, a number of changes have been made in the plan. What follows is the story of that plan: How it was started, how it has developed, and how it relates to the union-management relationship at Canadair.

BACKGROUND

The Company

Canadair Limited began in the 1920's as the aircraft division of Canadian Vickers, Ltd. The company assumed a separate identity in 1944 following a reorganization brought about by the Canadian Government. In 1947, Canadair was acquired by the Electric Boat Company of Groton, Connecticut, forming the basis for the organization that became the General Dynamics Corporation in 1952. In 1976, Canadair was purchased by the Canadian Government as part of a plan for re-structuring the Canadian aerospace industry. That plan has yet to come to completion, and Canadair remains a government-owned company. Because of the potential for restructuring, the relationship with Government appears to be an arms-length one, with overall responsibility for the organization vested in a Board of Directors.

Canadair has manufactured a variety of aircraft and aircraft subassemblies for both the military and commercial markets. The most significant aircraft now in production is the CL-600 Challenger, a third-generation, wide-bodied business jet. The Challenger development program began in 1976, with the first flight in 1978. By the time of first deliveries in 1980, over 120 of these aircraft had been ordered. In 1980, the company acquired sub-contracts for the Boeing 747SP, the Lockheed P-3C (the Aurora and Orion patrol aircraft) and the Boeing 767 Airliner.

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In considering the company, two factors are important in understanding the development of the Productivity Improvement Plan (P.I.P.). The first is the nature of the company's products, which are extremely complex pieces of equipment built to very close tolerances. The nature of the product is reflected in the manufacturing and assembly operations: many parts must be manufactured (or acquired) and brought together for assembly, with assembly taking place within a fairly limited time-span. The second factor is the customer, and the fact that over the years the government has been the major purchaser of the company's products.

The Union

Montreal Aircraft Lodge No. 712 of the International Association of Machinists and Aerospace Workers (I.A.M.), had over 5,400 members at the time the P.I.P. agreement was signed. The union became the bargaining representative of hourly-paid production and maintenance workers at Canadair in 1947. Two other unions are certified at Canadair: I.A.M. Lodge 2235 represents the Plant Guards, and the Canadian Marine Officer's Union, a small group of Power, Compressor and Refrigeration Room employees.

The Relationship

There were no strikes at Canadair after an initial one in 1947, although at times, pressure tactics such as slow-downs or refusal to work overtime were present at contract negotiation time. The union leadership was quite stable, but that stability began to disappear in 1962. According to the present union leadership, the contract negotiated in 1962 was considered to be an extremely poor agreement, providing only two to four cents in wage increases.

Partially as a result, in 1964, a new group assumed the leadership of the local. The new leadership was comprised of individuals who had been trying to get into power for years and who wanted to make many changes.

As might be expected, the labour-management relationship went through a period of some turbulence as the inexperienced, aggressive union leadership met with some management resistance. Combined with this were attempts by the Confédération des syndicats nationaux (CSN) to gain representation rights at Canadair and problems relating to the desire of French Canadians to see the workplace completely reflect the Quebec milieu in which it was located. The 1964 contract negotiations lasted for eight months and were climaxed by an 8-week strike. The strike was not totally peaceful, as some instances of picket line violence occurred.

Lodge 712 emerged from the strike several hundred thousand dollars in debt. Although the officers were all re-elected in December of 1965, the membership refused to authorize a dues increase that would eliminate the local's debt.

As a result of its financial difficulties, the local was put into trusteeship by the International Union. The trusteeship lasted for almost a year. In-

creasing employment at Canadair from 1966 to 1968 meant a larger membership and increased dues revenue and by the time the next contract negotiations started, the local's financial picture had improved considerably.

The 1967-68 Negotiations

As negotiations approached, the local found itself again under pressure from the CSN, which was again active in signing up members within the local. As part of the effort to resist the CSN's organizing efforts, the local attempted to divert the membership's attention from the CSN's overtures to contract negotiations. Suggestions for improvements in the contract were solicited, and the union asked the company to begin negotiations early. The company agreed, and the interest in negotiations, coupled with disenchantment with the CSN following the 1967 Montreal Transit Strike, helped turn back the organizing effort.

In the negotiations, the union needed a good settlement to make sure that the CSN was kept at bay. The International felt it had a stake in the negotiations and sent a representative from Canadian headquarters in Ottawa to oversee the process. There was also a great deal of membership pressure for a cost-of-living escalator clause in the new agreement. The old agreement had included a supplementary bonus to cover the expected increases in the cost-of-living resulting from the 1967 World's Fair in Montreal. This special bonus began in May and disappeared with the end of Expo in November.

The company was aware of these pressures. However, it faced other pressures as well. Perhaps the strongest was the pressure from its largest customer, the Federal Government, for increases in productivity. This pressure was not directed solely at Canadair. The Government was making many public statements about the need to increase productivity. Direct pressures might be expected by major suppliers to the Government such as Canadair.

For this reason, the company was reluctant to accept the demand for a contract that provided for cost-of-living increases. They believed that any increases had to be tied to increases in productivity. Given this goal, Canadair management explored the possibility of using various plans that tied increases in wages to increases in worker productivity.

The company considered and rejected piece-work plans, profit-sharing plans, the Rucker plan, the Scanlon plan, and the Kaiser plan. These plans were found wanting for a variety of reasons. The union had historically opposed piece-work plans. These plans were expensive to install and to administer and disagreements over standards were common. The standards for the Kaiser, Scanlon, and Rucker plans were difficult to establish, and could lead to disagreement. Profit-sharing plans might not have provided a payout to employees, at least at certain times. None of the plans seemed quite suited to an operation like Canadair which required careful coordination in the design, manufacture, and assembly of a huge number of component parts. An incentive system which did not have the same general impact in all parts of the operation could easily cause the manufacturing and assembly operations to get out of phase and result in a loss of efficiency, rather than improvement.

At this point, the company began to look at performance to schedule as an area around which to develop a program to increase productivity. At this time, work on two of the major contracts at Canadair was behind schedule. Although this was in part due to conditions beyond the control of Canadair, not producing to schedule had serious implications for the company. Delays meant that increasing amounts of working capital were tied up. Also, deliveries not made by promised delivery dates meant that the company incurred financial penalties, which reduced profits. Finally, the company reduced its attractiveness as a supplier by not meeting delivery dates — particularly in terms of the manufacture of subassemblies. Delays on these items meant that the customer's final assembly and delivery were affected.

The company decided to develop a plan which provided a bonus as actual production time moved closer to scheduled production time. The idea was presented to the union as a substitute for a cost-of-living clause during negotiations, and eventually the union agreed to it — along with a wage settlement similar to that being negotiated elsewhere in Canadian manufacturing. The new contract also contained another novel feature: an "honour system" of clocking out. Employees had to punch-in on the time clocks, but did not have to punch out. At the time the contract was signed, the principle of the plan was accepted but the exact amount of bonus payments for specific increases in on-schedule performance had not been determined.

The plan was called the Productivity Improvement Plan — or P.I.P. for short. In French, the plan was called, Plan d'amélioration de la productivité or P.A.P. Exhibit I presents a summary of P.I.P. bonus payments from 1968 through 1980. The parties agreed that efforts were needed to increase productivity and that employees should share in the benefits from such improvements. Productivity increases were to be measured by the ratio of "completed behind-schedule production position" to "a schedule position norm". Maximum payment was to be twelve cents per hour, and payment was to be made to all employees twice a year. A joint committee was set up to implement and administer the plan.

EXHIBIT I

Summary of Average Semi-Annual P.I.P. Bonus Payments 1968-1980

1968	JULY	\$ 19.00 per employee
	DECEMBER	\$ 40.00 per employee
1969	JULY	\$ 56.00 per employee
	DECEMBER	\$ 71.00 per employee
1970	JULY	\$ 86.00 per employee
	DECEMBER	\$ 94.00 per employee*
1971	JULY	\$121.00 per employee
	DECEMBER	\$140.00 per employee
1972	JULY	\$168.00 per employee
	DECEMBER	\$200.00 per employee

1973	JULY	\$242.00 per employee
	DECEMBER	\$249.00 per employee
1974	JULY	\$253.00 per employee
	DECEMBER	\$265.00 per employee*
1975	JULY	\$425.00 per employee
	DECEMBER	\$429.00 per employee
1976	JULY	\$451.32 per employee
	DECEMBER	\$461.83 per employee*
1977	JULY	\$553.00 per employee
	DECEMBER	\$338.73 per employee**
1978	JULY	\$500.45 per employee
	DECEMBER	\$514.45 per employee*
1979	JULY	\$581.60 per employee
	DECEMBER	\$650.00 per employee*
1980	JULY	\$700.00 per employee
	DECEMBER	\$700.00 per employee

INITIAL OPERATION OF THE PLAN

The joint committee took three months to work out the details of the plan. The bonus was to be paid on the basis of reductions in the number of days production operations were behind schedule. The anchor point for calculation was the "average days behind schedule as of March 1, 1968", which was stated as 22 days. If the number of days behind schedule was not reduced, there would be no bonus. When work was completely on schedule, the bonus would be 12 cents per hour worked. The relationship between a reduction in "average days behind schedule" and the bonus payment was linear. The figure for "average days behind schedule" was determined by dividing the total number of days that work in process was behind schedule by the total number of orders in work.

* Revised bonus rates in effect.

** Significant employment increase late in period affected the average bonus paid figure.

In practice, the Productivity Improvement Plan was intended to make employees more schedule conscious, to help them assign priorities to jobs that were most pressing. For example, a machinist, completing one job would not select from the pending work the easiest new job to do, but rather take the job that was behind schedule or which was due out of the shop soon. In general, work which needed to be done to keep production on schedule would be done first. The Productivity Improvement Plan was based on conditions which were highly visible to the individual employee. The worker could tell from the amount of work waiting to be processed if operations were on schedule. If there was no backlog, or if these production orders on material to be processed indicated that the schedule was being met, the worker knew he was earning his bonus.

The plan went into effect on March 1, 1968, Improvements in productivity, i.e., a reduction in the number of days production was behind schedule, began in the first month of operation. The bonus for March, 1968 was two cents per hour. By July, the bonus (and corresponding reductions in average days behind schedule) had reached five cents per hour, and the bonus paid in July was \$19. per employee. The December 1968 bonus payment was \$40. per employee. By the next July, the bonus payment had reached \$56. per employee, and in December of 1969 was \$71. per employee. In July 1970, the bonus payment was \$86.

CHALLENGE

But all was not well with P.I.P. Within employee ranks, there were complaints that, although a bonus was being paid, nobody could satisfactorily explain in detail how the bonus was calculated. That is, no one on the union side knew how the figure "total days behind schedule on work in process" was being calculated. The suggestion was made that some delays in work were due solely to managerial error, but that employees were paying the penalty for these errors in terms of a reduced bonus. In the election campaign, the union leadership was challenged by a group who said that the incumbent administration had not pressured management for enough information or for enough *management* action in increasing productivity.

On the other hand, some management personnel were expressing reservations about the plan. Some claimed that the plan was an administrative burden. Others said that the plan really did not measure increases in productivity. These individuals pointed out that reductions in the average number of days behind schedule (and increases in the amount of the bonus) could be accomplished by using an excess number of employees or by increasing the amount of overtime worked. Uncorrected changes in the schedule itself could lead to changes in the P.I.P. index and the bonus. There was some sentiment for developing a plan based on a more accurate measure of productivity increases.

A management study of the plan and its alternatives led to a decision to continue with the plan. Despite its short-comings, the company believed that the plan had increased productivity, had helped improve the union-management relationship, had improved the company's "on-schedule"

position, and had helped develop a spirit of teamwork, all without the normal problems associated with work measurement. The parent company, General Dynamics, was also interested in seeing the plan continue and hoped to see it or one like it applied elsewhere in the organization.

However, when the 1970 negotiations began, the new union leadership demanded that P.I.P. be discontinued. They cited all of the objections mentioned above as the reasons for their demand. As a result of negotiations, the plan was not discontinued, but management acted to meet the union objections to the operation of the plan. The formula was modified, so as to more accurately reflect employee contributions. More complete information and more substantial responses to union suggestions for production operations modifications were promised.

The new contract was for 18 months. The agreement provided for a 40 cent wage increase over the life of contract. Pension benefits were increased by 15 percent. For the first time, the French language version of the agreement became the "official" version. Two paid holidays were added, and the parties agreed to work out a new seniority system. The new system (whose exact dimensions were not known at the time the contract was signed) was to allow for the application of seniority for layoffs and recalls on a wider basis than had previously been the case. Over the next two years, the parties developed the new seniority system, building "job families" out of very narrow job categories. This new system was developed during a most difficult period when the entire aerospace industry was in a sharp decline and Canadair, as a consequence, was in the process of laying off some 4,000 employees.

THE REVISED PLAN

The basis for calculating the P.I.P. formula was changed during 1970 negotiations. The *basic* formula of total days behind schedule on work in process divided by the total number of production orders in work was not altered. However, the method of calculating the number of days behind schedule was refined and made more explicit.

The plant was divided into four areas and each area was given a number of "flow days" as a standard. Flow days were simply an average for the number of days parts were in a department for processing. Work would not be considered behind schedule until it had been in the area longer than the standard number of "flow days" and was actually behind schedule. The areas and the standard flow days for each were as follows:

Machine Shop Departments	—	45 Flow Days
Sheet Metal Departments	—	35 Flow Days
Sub-Assembly Departments	—	20 Flow Days
Final Line (Assembly)	—	5 Flow Days

The flow times were developed by the company's industrial engineering department. Any condition which caused work to be held up, which was outside the control of the hourly worker — such as a tool being repaired, or materials being unavailable — was not to be counted on as part of the standard number of flow days for a location.

This modification meant that employees would not be continuously penalized for work which was behind schedule. Under the old formula, work which entered a department behind schedule and left it still behind schedule did not result in a bonus. Under the new formula, work which passed through the department within the allowed number of flow days produced a bonus.

The changes in the measurement placed responsibility on the employee to identify work which could not be processed due to conditions beyond his control. For example, work which could not proceed because of a lack of materials or work which needed engineering modifications had to be "clocked-out" on the production — control system. If it were not "clocked-out" then it would be computed as being in production for bonus purposes.

The changes made the bonus standard more "measurable" and delays not caused by bargaining-unit employees more identifiable. Data on performance to flow-times as well as the existence of off-standard conditions were produced by the computer-based shop control system, with some manual corrections. This data was made available to the joint union-management committee. The P.I.P. index from which bonus payments were determined was based on the total of past due days (adding together the total number of production time in excess of allowed flow days in Machine Shop, Sheet Metal, Sub-Assembly and Final Line) divided by the total number of orders in process.

The bonus was also increased during negotiations. The maximum bonus payments were raised to 20 cents per hour from the previous 12 cents per hour. At the time the contract was signed, the bonus was about 9 1/2 cents per hour. Under the old agreement, the bonus rate was about .5 cents per hour for every one day reduction in the number of days behind schedule. However, only improvements in production to schedule above the level which existed at the time the contract was signed would be paid at the higher rate.

At this time, the P.I.P. administrator was changed. The new administrator was a former union president. This individual had left the bargaining unit to work in the company's production control department after the 1968 negotiations. He brought with him to the job of P.I.P. representative a knowledge of and friendship with members of the union executive and a knowledge of the shop control system which was the basis of P.I.P. measurement.

THE SECOND TWO YEARS

The 1970 agreement provided for the plan's continuance for two more years. Recalling the first part of this second period in the life of the plan, the parties had two major recollections about their behaviour on the joint committee which administered the plan. First, the union members were highly critical of management actions which reduced efficiency and the level of bonus payments. This criticism was highly vocal and quite caustic at times.

Management's response, in general, was to attempt not to be defensive or reply in kind. In part, they realized that there were inefficient practices in the company. The parties also faced problems of interpreting and understanding of the information the shop control system was producing. Management had quite an educational job to do with union representatives in terms of the operational significance of shop control system information. Over time, the intensity of union complaints softened and the atmosphere became, and has continued to be, more problem-solving in nature.

On the other hand, the union did not insist that all the changes which they sought, needed to be made immediately. Changes in systems methods or procedures could not easily be made overnight. The union was willing to accept some delays in implementation, with the promise that corrections would be made as soon as practicable.

In general, the parties' behaviour showed a growing acceptance of the realities that each side faced. The company accepted the fact that union officers made certain statements or demands because of the political pressures they faced. The union, on the other hand, realized that organizational realities affected the ability of the company to make some changes quickly.

In general, the flow of information from the company to the union and employees increased during this period. To a great extent, the increases in information were the result of the increasing sophistication of the shop control system. The change in the measurement of the bonus and its integration with the shop control system meant that detailed information on the operation of the plan — on a job order number and department basis, was available to the parties on a weekly basis. The new measuring system highlighted problem areas, and information on why problems were developing could be passed on through the joint committee to employees.

The union administration pursued a policy of keeping the membership fully informed. This meant that they fully explained all of their negotiation stances with the company, any grievance problems, and any information on the working of P.I.P. This policy also meant that the union executive attempted to answer any questions the membership had. They used the joint committee to get information from management. According to the union officers, the company was very responsive in providing the information requested: information on the plan, on the production control system on scheduling, as well as on miscellaneous matters.

Bonus payments continued to increase — because the bonus was higher and because production to schedule continued to improve. Perhaps the most amazing aspect of the improvements in "on schedule" performance was the fact that the improvement occurred in the face of massive layoffs at Canadair. From 1970 to 1972, about 4,000 hourly employees were laid off so that by mid-1972, less than 1,000 workers were employed in the bargaining unit. The normal tendency in a workforce might be expected to be to make the available work last longer. This behaviour did not seem to materialize at Canadair, at least to any greater extent.

As mentioned earlier, the parties developed a new seniority system while the layoffs were being made. They did this by what could be described

as a continuous-bargaining process. Agreement on regrouping of existing jobs was reached first. Frequent meetings followed in which the operational details including the application of the system to specified situations, definitions, and training and re-training programs were hammered out. The process was oriented toward problem-solving and real disagreements were rare. Only two or three grievances resulted from the continuous negotiation-layoff process, and none of the grievances reached arbitration. The parties believed that their ability to renegotiate the seniority system as they did stemmed in a large part from their prior experience and success with P.I.P.

FURTHER MODIFICATION

A new collective agreement was signed in July, 1972. The contract provided for a fifty cent wage increase over the two-year agreement. Group insurance and pension benefits were also increased.

The maximum bonus payable under the Productivity Improvement Plan was increased from 20 cents to 25 cents. As had been the case in the 1970 modification, the increased rate would be paid only for improvements in the scheduled position beyond that which had already been achieved. The allowed flow times were also reduced. The "flow time" standard was reduced from 45 to 40 days in machine shop departments, from 35 to 31 days in sheet metal departments, from 20 to 17 days in sub-assembly departments and from 5 days to 3 days in the final assembly line.

The changes were made to allow for a continuing incentive in the P.I.P. system. At the time the agreement was signed, production was close to being completely "on time". The parties believed that continued progress would be more difficult and that an extra incentive would be needed to insure a movement to a completely on-schedule position. Also, increases in the P.I.P. bonus helped to maintain the relationship between the bonus and regular hourly wages which had also been increased. The changes in the flow time standards changed the definition of "on time" performance, but the changes were in line with the actual flow times the parties had been experiencing under the plan.

In late 1972, the tooling operations were measured in the operation of P.I.P. for the first time. Until this time, the volume of work in the tool manufacture area had not warranted the measuring of work in this area. The inclusion of the tooling area was timed so that its impact on the total bonus would be minimized. The integration of the tooling area was successful in two ways: the tooling section "on schedule" performance was satisfactory and the overall production to schedule continued to show improvement. The December 1972 bonus was about \$200. per employee, which meant that operations were only three days behind schedule.

In addition, a special payment of 3 cents per hour to employees with 20 years or more of service was made. The rationale for this change was that the experience of the more senior workers allowed them to make a greater contribution to productivity increases. The extra bonus reflected this belief. In another way, the P.I.P. bonus became a vehicle for rewarding senior

workers that could not be accomplished through the regular wage system. That wage system provided that the maximum rate in each job classification would be paid after one year on a job.

1974 CHANGES

In the negotiations for the 1974 collective agreement, the Productivity Improvement Plan was expanded to include bonus payments for improvements other than production to schedule. The rate of bonus payment for schedule improvement was again increased and the number of flow days allowed was again reduced.

The agreement was for 24 months and provided for wage increases up to a 32 percent over its term. The contract also provided for significant increases in the level of disability benefits and for pension increases of 10 to 20 percent. The settlement reflected the inflationary times just prior to the imposition of wage and profit controls by the Liberal Government.

The pressure faced by the parties for real income protection was not dissimilar to that which they faced in 1968. Production was within 2.5 days (on average) of flow schedule, and little significant improvement in schedule position or earnings from the P.I.P. formula could realistically be expected. Given the company's reluctance to agree to a cost-of-living provision, and the parties success and satisfaction with P.I.P., the move to providing bonus payments for factors in addition to schedule improvement was quite rational.

The factors chosen were the suggestion plan, programme excellence (a quality improvement plan) and accident prevention. For some time prior to 1974, Canadair had been involved in programmatic attempts to achieve increases in employee suggestions (with payments of 10 percent of the first-year savings paid to employees), to increase product quality, and to reduce accidents. Management believed that the Productivity Improvement Plan and the teamwork that it generated had helped to reinforce these efforts.

One index was developed for suggestions, two for accidents and one for programme excellence. The index for suggestions was: 1) The Monthly Value of Savings resulting from suggestions per 100 employees. At \$500. savings per 100 employees, the bonus payable was five cents per hour worked — the maximum bonus payable. At \$100. savings per 100 employees, the bonus was 1 cent per hour worked. The bonus was designed to be self-sufficient, with approximately \$.76 of each dollar saved, paid back to employees and \$.24 retained by the company for the administration of the plan.

The formula for the programme excellence element in P.I.P. provided a bonus based on reductions on the monthly repair, replacement, and rework costs (both material and labour) per employee. At a \$12.60 average dollar cost of repair, rework, and replacement, the bonus value was zero. At \$2.50 per employee, the bonus paid its maximum value of ten cents per hour worked. In essence, this element paid a bonus to employees for reducing the cost of human error. This element was also self-sufficient with about

\$.71 of each dollar saving paid back to employees, with the remainder retained by the company.

For accident prevention, bonus formulas were developed to measure and reward decreases in accident frequency and severity. For accident frequency, the formula had the total number of disabling accidents per month times 1 million hours divided by the total number of man hours worked during the month. At a frequency of 8.1 or greater, no bonus was paid. At a zero frequency rate, the bonus paid was 5 cents. An index for accident severity was developed based on the total number of days charged as due to last time accidents during a month times 1 million hours divided by the total number of man hours worked during a month. A severity rate of 81.0 or higher produced no bonus, while a severity rate of zero produced the maximum bonus payment of 5 cents.

The safety indexes represented an attempt to reduce the frequency and severity of accidents at Canadair to a level more consistent with that at the parent company (General Dynamics) and with the aerospace industry in general. For example, for the first nine months of 1974, Canadair accident frequency rate (for hourly employees) was 16.49 compared to 8.86 for all General Dynamics employees and 2.52 for all employees in the U.S. aerospace industry. The Canadair production employees' accident severity rate was 225, while that for all General Dynamics employees was 123.37 and all U.S. aerospace employees was 170.

The maximum bonus payable for schedule improvements was also increased in the 1974 negotiations from 25 cents to 30 cents. At the same time, the number of flow-days allowed was reduced by 20 percent. At the time of the change, production was running about 2-3 days past due to flow schedule.

Also in 1974, the seniority bonus payable to employees with more than 20 years' service was increased from \$80 per year to \$200; a bonus was added for employees of 10 or more years' service at \$100 per year.

Shortly after the negotiation of the 1974 agreement, employment at Canadair fell to its lowest level in recent years, reaching a bottom of about 650 employees late in 1974. The number of employees remained below 1,000 until 1977.

Prior to the 1974 changes, production employees at Canadair were earning about 85 percent of the maximum possible bonus. The 1974 changes (excluding the seniority bonus) doubled the amount potentially available in bonuses. Improvements continued to be made in performance to schedule, with average days past due to flow schedule falling below 2 days in 1975, to an average of 1.6 days.

Performance in the areas measured by the new bonus elements — suggestions, safety, and quality control — was similar to that experienced in the early days of P.I.P., that is, there were no dramatic increases in performance, but rather steady improvement in all areas. The new elements, understandably, added more variability to the bonus payments. Months with no accidents were recorded, providing the maximum possible bonus for those measures. By 1976, after two years' experience with the additional

bonus elements, production employees were earning the same percentage of maximum bonus (86 percent in June 1976) as they were prior to the introduction of the new elements. Over the two year period, the amount paid per hour in bonuses continued to increase.

1976 AND 1978 CHANGES

In 1976, a one-year collective agreement was signed, which included further changes in the Productivity Improvement Plan. A wage increase of from 8.8 to 9.7 percent and a provision for three weeks paid vacation after 5 years' service (reduced from the previous requirement of 10 years' service) were the other major changes in the agreement.

The maximum productivity bonus payable was increased from 50 cents per hour to 70 cents per hour. This was done by increasing the bonus payable under programme excellence from 5 cents to 10 cents, and by adding two new elements to the bonus formula. These were 1) The number of accepted suggestions submitted under the suggestion program in a month. This element paid a maximum of 5 cents at 1.1 suggestions per 100 employees per month, at .1 suggestions, and 1 cent at .3 suggestions. And 2) The number of consecutive accident-free days, which paid a maximum bonus of 10 cents per hour. The seniority bonuses were also increased to \$150. for those with 10-20 years' service, and \$300. for employees with 20 or more years' service.

The one-year agreement signed in 1977 provided for wage increases ranging from 7.8 percent to 8.5 percent. The agreement also provided for paid vacations of 4 weeks after 15 years (reduced from 20), increases in health and welfare benefits and increases in pension benefits of 10 to 20 percent. No changes were made in the Productivity Improvement Plan.

The formal end of the Federal Government's income control program also brought a return of a multi-year agreement to Canadair in 1978. The three-year agreement signed in mid-year provided for immediate wage increases ranging from 9.4 to 10.7 percent, and for increases of from 5.9 to 7.1 percent in 1979 and from 6.2 to 7.4 percent in 1980. Shift premiums were doubled to 30 and 50 cents for second and third shift work. Also, a reporting pay provision was added to the contract; five weeks of vacation were provided to employees with 25 or more years of service; improvements were made in health and welfare provisions, and pension benefits for employees with 25 or more years service were increased. The company also agreed to contribute one cent per hour worked to a union training fund.

Changes were also made to the Productivity Plan bonus. The parties were not satisfied with the usefulness of the "number of consecutive accident-free days" measure which had been added two years earlier. Instead, they decided to increase the bonus amounts payable under the accident frequency and severity measures to 10 and 15 cents per hour worked, respectively. The factor dropped had a maximum value of 10 cents per hour, while the additions were worth a maximum of 15 cents (a five cent increase to the frequency factor and a 10 cent increase to the severity factor). This brought the total potential productivity bonus payable from 70 to 75 cents per hour worked.

In addition, the definition involved in the element measuring the number of suggestions submitted was changed from the number of accepted suggestions submitted to the number of *acceptable* suggestions. This change was an attempt to more quickly reflect useful suggestions in the bonus calculations. The investigation and *formal* acceptance of suggestions was a time-consuming process, and the parties believed that the change would allow the bonus to more accurately reflect suggestion activity in a given month at a time closer to the actual incidence of the suggestion activity. The changes also allowed for the measurement of useful suggestions that might for various reasons not be capable of being implemented.

The 1978 agreement also provided a 10 percent (8 cents) increase in the total potential bonus payable on July 1, 1979, bringing that total to 83¢ and another 10 percent (8 cents) on July 1, 1980. These increases would serve to maintain the relationship between bonus payments and wage levels in the plant.

1980 REVISIONS

In 1980, changing conditions produced an early reopening of the collective agreement at Canadair and changes in P.I.P. Changes in the Montreal labour market, particularly in the aerospace sector, acted to worsen Canadair's market position. Employment increases at the Air Canada aircraft maintenance operation and at other aircraft companies helped to increase wage levels, weakening Canadair's relative position and tended to increase turnover. The passage of Bill 17 in the Quebec Legislative Assembly tended to reduce the incentive for improvements in safety performance, at least according to Canadair and the local Union.

As a consequence, the parties agreed to drop the two safety elements from the Productivity Improvement Plan, rolling the 30 cent bonus into base wage rates as of July 1, 1980. New bonus elements were to be added to replace the elements which were dropped. For a variety of factors, the introduction of new bonus elements was delayed until after this writing, to at the earliest, July 1981. The general wage increase scheduled for January 1981 was advanced to October 1, 1980.

In December of 1980, the collective agreement was re-opened six months early. The new agreement begun January 1, 1981 had an expiry date of July, 1982. Wage increases of 9.9 percent over the life of the agreement were negotiated. In order to maintain the relative size of the P.I.P. bonus in relation to wages, an automatic 1 percent per month adjustment factor was added to the bonus formula.

A new bonus, called the Attendance Improvement Formula was created. They paid a bonus of 30 cents per hour for each week in which a full 40 hours (excluding overtime) was worked. A bonus of 15 cents per hour was paid for weeks in which no more than 2.5 hours of work were missed. Below that level of attendance/tardiness no bonus was paid. The attendance bonus was paid quarterly, separate from the P.I.P. bonus.

RESULTS TO DATE

By the time the 1980 agreement expires, the Productivity Improvement Plan will have been in operation at Canadair for fourteen years. The plan has withstood the test of time, of radical changes in the employment level, in products, and in ownership. By these measures, the plan has been successful. The parties are clearly committed to it.

From the employees' standpoint, over \$12 million in bonus payments (excluding the seniority bonus) have been received. From the company's standpoint, the operation of the productivity bonus system has cost less than a straight cost-of-living agreement would have. This is true because the productivity bonus is paid only on hours worked and not on hours paid, and because wage levels at Canadair have been adjusted less frequently than they would have effectively been had a typical cost-of-living agreement been part of the collective agreement.

This is not to say that overall, Canadair workers have suffered declines in real income. For example, between July 1968 and July 1979, the Consumer Price Index increased by 113 percent. Wages at Canadair over that time increased from 137 to 185 percent. When the productivity bonus figures are added to hourly wages, the increases in total wage levels at Canadair in the 1968-79 period rise to between 155 and 214 percent. In contrast, average weekly earnings in Canadian manufacturing during the same period increased by 171 percent.

Under the operation of the plan, the company has achieved significant improvements in its capacity to manufacture to schedule, improving its reliability as a contractor and sub-contractor. The Productivity Improvement Plan has reinforced and helped improve the company's quality and safety records, and via the suggestion plan elements has helped to improve manufacturing efficiency.

The plan has produced these results not only by offering hourly employees financial incentives for "working smarter", but also by serving as a vehicle for helping management to identify problem areas or situations which are crucial to its manufacturing or employee relations objectives.

In this context, it is important to note that the bonus calculations at Canadair are not produced in a purely mechanical fashion. The data upon which the bonus is based are subjected to manual correction by the plan's administrator, and to, at times, *negotiations* between the parties. Work delayed because of a management decision or because of considerations outside of management or worker control may not be counted as late or behind schedule for bonus calculation purposes.

The operation of the Productivity Improvement Plan is, as evidenced by the above, strongly conditioned by the nature of the union-management relationship at Canadair, and has, in turn, strongly influenced that relationship. Certainly the nature of the relationship prior to 1958 does not provide much evidence that the successful operation of P.I.P. was even a remote possibility. The history of P.I.P. at Canadair suggests that while its initial adoption served particular needs which existed at the time, the experiences

of the parties with the plan have helped demonstrate and reinforce the mutual benefits obtainable from an accommodative and even cooperative orientation.

The union-management relationship at Canadair is characterized by a great deal of daily give and take interaction, by a fairly high level of communication and understanding. Just as the Productivity Improvement Plan is innovative, its operation has helped the parties develop other innovative approaches to employee relations as well.

An example of an innovative approach is the Attendance Improvement Formula developed during 1978 contract negotiations. The program was developed in response to a union demand for paid sick leave or paid personal leave (for situations not covered by workman's compensation or long-term disability benefits). The company was initially hesitant to provide what might come to be viewed as additional paid holidays — or days of entitlement. The formula ultimately worked out through negotiations provided up to 5 days (in the second year of the contract) of "attendance credits" which could be used by an employee for personal absences, which would be compensated for at a rate of $66 \frac{2}{3}$ percent of his normal daily wage. At the end of a year, all employees with unused "attendance credits", would be paid for twice the number of those unused credits at $66 \frac{2}{3}$ percent of his normal daily wage rate. The year end figures are calculated on November 30, so that the payment for unused personal leave days is made prior to Christmas along with the payment of the P.I.P. bonus.

As another example of innovation, in late 1979, Canadair began a new fitness and recreation program for its employees. Under this program, the company spends money to subsidize fees and provide equipment and facilities for fitness and recreation, while the employees provide the informal structure, including coaches and organizers. The program has met with an unusually enthusiastic reception among employees in its early stages, with, for example, over 350 individuals participating in a broomball league. The company hopes to use the fitness program to provide exercises for employees with conditions such as weak backs which makes them prone to accidents or injuries at work.

The fitness program was combined with product improvement in an unusual program in the last six months of 1980. In an attempt to reduce fuel consumption and increase the range of the Challenger, in response to changes in the energy situation which had occurred since the plane's inception, the company began a campaign to reduce the aircraft's weight. As an incentive for employee suggestions to that end, the company offered a bonus of \$1 per pound per plane sold for each accepted suggestion. As a companion program, the company offered each employee \$1 per pound of individual weight loss over a six-month period and \$2 per pound if the employee reached his ideal weight.

The two programs resulted in a 3,000 pound reduction in the weight of the aircraft and a loss of six tons in the weight of employees! An added bonus from the company's perspective was an increased awareness on the part of employees of the consequences on fuel efficiency of unnecessary drag in an aircraft, resulting from such manufacturing factors as rivets set a few thousandths of an inch off the ideal.

Another example of an innovative approach to a problem can be seen in the company's appointment of an hourly-rated employee, and member of the union executive, as a safety inspector or safety ombudsman. The individual has been assigned the job of investigating and reporting on safety complaints, of working informally with lead hands to improve safety performances, of keeping the union informed as to progress toward solving safety problems, and cutting red tape in their solution whenever possible.

Another area in which the impact of the union-management relationship and the operation of P.I.P. can be seen is in the grievance rate. Prior to 1968, there were 60 to 80 formal grievances per year, while in 1980 the number of formal grievances was 5 or 6 per year. There were no grievance arbitrations from 1971 through 1978. In 1979, three grievances were taken to arbitration. The low grievance rate existed even though employees were represented by company-paid, full-time grievance committeemen. The union estimates that 90 percent of employee complaints, questions, or problems are handled during an initial investigation, a further 7-8 percent are handled at the informal complaint, i.e., verbal stage; and another 10 percent in a weekly union-industrial relations staff meeting; leaving only 2 or 3 percent to emerge as formal, written grievances.

Aside from the tangible benefits of the plan, the operation of P.I.P. has provided some obvious psychological benefits. The parties clearly evidence a sense of accomplishment. They not only believe that they have achieved increases in productivity, but improvements in working together. Employees are given a chance to contribute, and their contributions are recognized.

All is not necessarily sweetness and light, however. The operation of the plan does create stresses between the plan's administrator and the union and various other functional areas, including both line and staff groups in production. However, the focus of P.I.P. is to improve operations, and such improvements are not likely to come easily, without some internal conflicts.

The continued existence of the plan over 14 years (at least until the 1982 expiry of the 1980 agreement) can be seen as evidence that the parties are satisfied with it. Employee acceptance of the plan and of their union's role in it, can be seen in the fact that the entire union executive was returned to office by acclamation in 1972, 1975, 1978, and 1980.

In the general climate of labour relations in Canada and in Quebec in particular, the fact that the Productivity Improvement Plan at Canadair has operated as long as it has and as well as it has is indeed an accomplishment. The historical willingness and ability of the parties to make changes in the plan has no doubt been a significant factor in its longevity. This flexibility probably is the greatest guarantee that the plan will continue to operate in the future.

ANALYSIS OF THE PLAN

The following discussion, although not exhaustive, appears to the author to highlight the key factors responsible for the success of the plan.

These points should be of concern to anyone interested in introducing a similar plan elsewhere, in that certain conditions probably need to be met before such a plan can have a reasonable chance for success.

First of all, *the initial measurement basis for determining changes in productivity was uniquely suited to Canadair*. The nature of the production operation in the company was a complex manufacturing and assembly operation — to very high standards — that resulted in a very small number of finished products. The proper scheduling or sequencing of manufacturing and assembly operations was crucial to final success. At the time the plan was introduced, the company was not operating on schedule, and its inability to operate on schedule was having a negative effect on the company.

The adoption of a bonus scheme based on improvements in schedule position thus made a great deal of sense in terms of both the nature of operations and the particular problems the company was facing. A similar measurement of productivity would not be very useful elsewhere. In short, the measurement basis must suit the situation.

Aside from these considerations, *the parties both had strong needs that could be met by the plan*. At the time the plan was first introduced in 1968, the union faced a demand for some kind of bonus to replace a special cost-of-living bonus that ended with the close of Expo. The company faced a great deal of pressure from many sources to increase productivity. If these pressures had not existed, the parties might never have attempted to set up a plan like P.I.P.

The elements that were added to the program in 1974 and subsequent years, were based on existing company programs in the case of the suggestion plan and programme excellence, and on an area of concern to both the company and the union in the measures regarding safety. The parties not only had had some general prior experience with the measures, but improvements in the areas newly included in the productivity bonus plan had a payoff clearly related to productivity for both parties. The parties' willingness to add new bonus elements was no doubt conditioned by their success with the original schedule — improvement factor. The inclusion of the new elements also allowed for an escalation in bonus payments, which was particularly critical since continuing improvements in performance to schedule promised to be difficult and marginal after 1974, and the size of bonus payments relative to hourly earnings needed to be kept at a level that could maintain employee interest in the plan, particularly at a time when inflationary pressures were strong.

Thus, the fact that *the amount of bonus payments has always increased* can also be said to be a critical element in the success of the plan. The increase has been a result of increases in performance in the elements measured by the bonus formula, by the addition of elements, and increases in the bonus rate. The net effect has been that continued increases in performance have been increasingly rewarded, and that there have been real incentives for continued improvement.

The plan always has paid a bonus. Even when the union and individual employees did not completely understand the new shop control system and how the bonus was being calculated, they could accept the plan because it was providing a payout, and because they could see the amount of work that was either on schedule or behind schedule. From the very beginning, the bonuses indicated that progress could be made and that progress would result in financial benefit to employees, if nothing else. The existence of bonus payments has always had a self-reinforcing impact on the plan.

The bonus payment method has proved beneficial. By paying the bonus only twice a year, the total amount paid has been of fairly significant size. The first bonus was only \$19. per employee, but this was only after then it would have been had it simply been added to weekly paychecks. Of course, the recent bonuses of \$650. have had an even greater impact. The bonus is paid at times when the money is generally more useful and thus more meaningful: just before the summer vacation shutdown and at Christmas. When coupled with the special seniority bonus, the bonus payments in 1980 were \$1,400. for some employees. As one union spokesman said, "How many opportunities does a typical blue collar worker have to accumulate \$1,000? He can do that here."

Despite the size of the bonus in recent times, *the Productivity Improvement Plan and the bonuses paid thereunder have not been a substitute adequate contract settlement.* The 1968 agreement, in which P.I.P. had its beginnings provided for wage levels at Canadair which were equal to those paid in other heavy, manufacturing operations. All of the following settlements appear to be in line with settlements that were being negotiated elsewhere in Canadian manufacturing. In this sense, the P.I.P. bonus was an "extra" that accrued to employees as a result of their performance. It was not a substitute for lower-than-average increases in wage and fringe benefits although it was a substitute for a cost-of-living clause. Thus, in one sense, initially the employees did not have that much to lose if the plan did not work well. Since it has worked well, their gains have been greater than other workers in other companies.

The plan was also ideologically acceptable to the union. The union had traditionally opposed piecework incentive plans, and they wanted nothing to do with anything that smacked of "sweat shop" conditions. They operated under the assumption that the membership already was providing the company with a fair day's work. The plan implied that people work "smarter" but not "harder" and on this basis was acceptable to the union.

The plan was based on conditions which were well-known and highly visible to employees. With regard to the initial performance to schedule element, workers had always been aware of the need to operate on schedule. They knew when jobs were both on schedule and not on schedule, and they could tell by just looking around them whether they were earning a bonus. Thus employee faith in the plan was not based only on financial or production data, but on conditions they could actually observe. The suggestion safety, and quality work elements were similarly under employee observation and control.

The informality of the proceedings has also been a help. Since the plan's inception, all proceedings have been informal and "off the record". Within this informal relationship, information can be exchanged, proposals made, criticisms and suggestions can be offered, without any definite commitment on behalf of either of the parties to a particular course of action or without the danger that sensitive information or comments might become general knowledge.

The plan does not operate in a vacuum; it operates as part of a larger union-management relationship. *The ability of the parties to work well in general, helps to make P.I.P. work well.* In this relationship, the parties evidence a strong desire to handle all problems quickly and informally. Communications between the parties are extremely good. The union leadership is careful to communicate fully to its membership.

One of the factors which has helped the plan to operate well has been the particular individuals on both sides of the table. *The leadership of both union and management has been very strong.* Both union and management have shown a great deal of ability in dealing with each other and with members of their relative constituencies. The plan would probably not have continued to operate well had it not been for the personalities and ability of the people directly involved with it. Also, *the leadership on both sides has been relatively stable.* That is, there have not been many personnel changes in critical positions, in either the union or the management.

One factor of possible importance was the massive layoffs at Canadair. On one hand, they possibly generated some concern over the company's health on the part of employees. On the other hand, the layoffs meant that younger, more militant employees were not part of the workforce for an extended period as the plan matured. These younger employees might have challenged the union leadership on the way the plan operated had they been present. During a large portion of the time the plan has been operative, the membership of the local has been composed primarily of older, more stable workers, thus the union leadership job may have been easier and the operation of the plan facilitated.

Finally, the willingness to change the basis of bonus calculation has probably added to the life of and improved the operation of the plan. The method of bonus calculation was first changed in the 1970 negotiations. This change made the calculation more explicit and also insured that the employees were not charged with delays not of their making while making employees responsible for recording these delays in the production control system, while improving the information and the plan's acceptability. This change also made delays which were caused by other factors more observable and more likely to achieve attention from management.

The subsequent adjustments in the bonus rate provided an incentive for continued improvement as the company's operations moved closer to a fully on-schedule position and improvement became more difficult to achieve. The reduction in the flow times in 1972 and 1974 helped keep the plan realistic. The change from accepted to acceptable suggestions in 1978 was a similar move.

The flexibility in altering the formula has been reflected in its weekly and monthly application. The formula is not followed slavishly. Manual corrections and adjustments are made to reflect abnormal conditions created by the company, and to keep the bonus as a motivator.

These appear to be the major factors influencing the success of P.I.P. at Canadair. Clearly, in many ways, the plan is unique, just as are the conditions out of which it grew and in which it operates. Nevertheless, the plan stands as evidence that if the parties are innovative, imaginative, and willing to work hard, cooperation is as likely a result as is the conflict that is so much more widely known (if not truly experienced) under our present industrial relations system.

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