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Actuarial Report re Pension Plan Considerat

A. V. ROE CANADA LIMITED

and Subsidiary Companies

THE Wyatt COMPANY
ACTUARIES
AND
EMPLOYEE BENEFIT CONSULTANTS

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March 20, 1957

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SECTION I. - Introduction

The principal purpose of this report is to outline a Basic Noncontributory Pension Plan to which all employees of A. V. Roe Canada Limited would automatically be eligible and to consider the design of a Supplemental Contributory Pension Plan to provide additional pension benefits to those employees who elect to join the supplemental plan.

In considerations relating to the design of both the basic and the supplemental plans, it is necessary to bear in mind (a) the existence of pension programs for some employees of certain of the subsidiaries, and (b) the fact that the forthcoming negotiations for two of the subsidiaries are expected to involve a union demand for pension benefits.

This report also sets out the cost indices of the proposed plans but since the time available for this study was rather limited, it was not possible to assemble complete data on all employees in a uniform manner. Accordingly, pension plan costs have been determined for the employees for which reasonably complete data wer e furnished and aggregate costs have been estimated therefrom by proration.

The matter of financing the proposed Basic and Supplementary Plans is also considered, and the relative merits of the insurance company and the trust company facilities for this purpose are considered.

In view of the existence of certain pension plan arrangements, it becomes necessary to give consideration to the integration of these existing plans with the proposed plans. A section of this report treats with this particular problem.

In developing an employee pension plan, it is desirable to have readily available for comparison purposes the corresponding benefits currently being furnished by other somewhat similarly situated companies. Illustrations of such plans are also included in this report.

Accordingly, this report is prepared in the following sections:

II. Basic Pension Plan

III. Supplementary Pension Plan

IV. Cost of Basic Plan

V. Integration of Present Pension Plans with Proposed Basic and Supplementary Plans

VI. Financing Media

VII. Illustrative Benefits in Other Pension Plans

SECTION II - Basic Pension Plan

In a report, treating with pension plans and related matters, prepared by members of the Company's Staff, the fundamental design of one form of suitable pension plan has been very ably set out. In the main we agree with the approach to pension plan design which is expressed in that report and have so indicated in our preliminary report to you dated February 15, 1957. The fundamental philosophy that the cost of pensions and allied benefits is deferred compensation is, we believe the most logical of all the theories that profess a pension benefit to be (a) a gift, (b) a convenient means of fulfilling an employer's responsibilities toward his old and loyal employees, (c) a reward, (d) continued payroll, (e) deferred compensation, (f) a charge for human depreciation, (g) organized savings, (h) a social service, (i) a business economy required by practice of competitive employers, and (j) a union commitment.

Unfortunately, the deferred compensation approach, while sound in theory, does not admit of practical application in all aspects because under any system of allocating pension plan costs to individual employees the costs for a unit of benefit vary greatly according to age and sex (and for some benefits the dependency status) of the employees and are usually not directly related to their current, aggregate, or average annual compensation. As a practical matter, it becomes necessary to view the deferred compensation approach in a rather general way rather than as a specific means of allocating or justifying pension plan costs.

In the design of a suitable basic pension plan, two somewhat differing approaches are found, (a) the design, favored by management with good reason, which uses a benefit accrual rate which is a percentage of each year's pay, and (b) the somewhat more frequently found type of negotiated plan, generally demanded by unions, which involves a flat dollar amount of benefit accrual in respect of each year of employment. While it is our opinion that either of these two types of plan may be designed as a satisfactory employer relations instrument, it seems best at this point to set out, side-by-side, a brief resume of the major provisions of an example of each of these two types of plans. This will be found on page 3. It should be stressed that in most of our considerations to date we have based benefits on future service only, and these illustrative plans are intended to cover only such service (even though it is quite probable that the unions will demand that all service, past and future, be credited for pension benefit purposes).

Commentary on Illustrative Plans - It is to be expected that the unions in demanding a pension plan will press for Plan A, since that is the more popular type particularly in the Automotive, Machinery and Aviation Manufacturing areas. However, the second general type, set out as Plan B, is somewhat similar to the form of plan widely used in the Steel Industry 1/ apparently partly because this was the pattern which had been established by a few large steel companies prior to pensions becoming a major issue at the bargaining table. While it is likely that the Plan A type of pension system will be requested by the unions it is, of course, also likely that they will initially demand a somewhat higher pension benefit accrual rate than the $2.25 rate indicated above in the illustrative Plan A and that in other respects the benefit structure will be considerably more generous than is indicated in the foregoing brief outline. However, if it is desired to calculate costs for increased rates of benefit accrual reasonably satisfactory answers will be obtained by merely applying the benefit ratio (desired benefit divided by the basid benefit in Plan A or B) to the cost figures in Section IV of this report.

1/ The steel type of Plan (U. S. companies) has some significant differences, e.g., benefits are accrued at 1% rate applied to 10-year final average compensation. "Social Security" fixed at $85 a month is deducted and a minimum benefit of $2.40 per month per year of service prior to 11/1/57 and $2.50 per year of service after 11/1/57 is included (these amounts not being subject to deduction on account of Social Security).

Brief Outline of Illustrative Pension Plans (Basic Plan)

	Plan A (Flat Benefit Type)	Plan B (Percentage of Compensation Type)
(1) Eligibility	Immediate (i.e., automatic)	After 3 months of full-time employment.
(2) Pension Formula	\$2.25 per month per year for all service after effective date of Plan.	3/4% (or, alternatively, 1%) of covered compensation (to be defined) after effective date of Plan.
(3) Vesting	100% at age 40 with 10 years' service.	Under 5 years' service -0% 5 years but less than 6 years -50% 6 years but less than 7 years -60% 7 years but less than 8 years -70% 8 years but less than 9 years -80% 9 years but less than 10 years -90% 10 years and over -100%
(4) Normal Retirement Age	Age 65, with 10 years' service	Age 68.
(5) Automatic Retirement Age	Age 70.	Age 70.
(6) Early Retirement	Age 60 with 10 years of service.	Age 60.
(a) Voluntary	Accrued benefits (to retirement) with .6% actuarial reduction for each month before Normal Retirement Age.	Accrued benefits (to retirement) with .6% actuarial reduction for each month before Normal Retirement Age.
(b) Company Option	Accrued benefits, without reduction.	Accrued benefits, without reduction.
(7) Late Retirement	Employee continues beyond Automatic Retirement Date at option of Company. Such service possibly not to be counted for pensions. (to be decided later).	Employee continues beyond Normal Retirement Age at option of Company. Except for employees in Plan at its inception with less than minimum amount of service to establish a

	Plan A (Flat Benefit Type)	Plan B (Percentage of Compensation Type)
		benefit credit, no pensions accrue on service beyond Automatic Retirement Age.
(8) Total and Permanent Disability	Accrued Benefits without actuarial reduction. Employee eligible if 15 years' service and totally and permanently disabled for 6 months.	Accrued benefits without actuarial reduction. Employee eligible if age 50 with 15 years' service, if totally and permanently disabled for 6 months.
(9) Financing	Employer-pay-all.	Employer-pay-all.
(10) General Comments	Supplementary Plan to be offered on a contributory basis.	The union may demand that a minimum benefit accrual rate, such as $2.00 per month per year of service, be included in order to protect against possibility of lowered compensation levels. In many plans using a percentage of pay benefit accrual rate, the benefit is based on final average compensation (such as the average annual compensation for the 10 years preceding retirement). Supplementary Plan to be offered on a contributory basis.

The advantages of the Plan B over Plan have been clearly enumerated by your Staff Committee assigned to initiate a study on pensions. They include (a) each year's pension benefit accruals will be tied directly to each year's compensation so that as compensation increases so will pension benefit accruals, with the result that there may be less tendency to "reopen" the pension plan benefit provisions at each succeeding negotiation, (b) since each year's benefit accrual is obtained by applying a percentage rate to the amount of compensation for the year (whether base compensation or base plus overtime, etc.), the formula is more readily defined than that of Plan A whereunder it is necessary to promulgate rules and procedures for determining each year's creditable service (e.g., 1/10th year for each 165 hours worked), which rules and procedures are likely to increase the administrative work required under the Plan. While it is certainly true that the percentage of pay accrual formula (viz., 3/4% of compensation) makes it relatively simple to determine each year's benefit accrual and, therefore, should simplify the administration of the plan, it is nevertheless almost certain that the union will expect to participate in the administration of such a plan just as it would in the case of a Plan A type.

While there are good reasons for limiting the credited service under the Pension Plan to service after the effective date of the Plan (rather than including all service, i.e., past and future service), it would almost seem necessary to make the benefit accrual rate, on such future service only, somewhat higher than would be the case if all service, future and past, were to be credited. Ultimately, of course, the effect of the past service exclusion will vanish since each newly hired employee will receive full credit for all service (excepting, of course, any nominal amount such as 3 months, which may be required as an eligibility condition). If the Company is then left with a pension plan having higher accrual rates than its competitor employers, (because initially such higher rates were adopted to compensate for the non-crediting of past service) the gains expected to result from the exclusion of past service would be illusory indeed. This possibility is, of course, one of the strongest arguments for keeping the accrual rate under a future-service-only plan within modest limits and then offering a supplementary plan (again in respect of future service only) which will make available to interested employees the opportunity to bring the benefits in the basic plan up to a more adequate level. Alternatively, in order to protect the company from offering a high rate of accrual on future service (which would actually be applicable to all service - even as much as 40 or 50 years - as newly hired employees replaced the present employees with prior service), it might be possible to restrict the credited service period to a maximum number of years, such as 30. However, the unions in recent negotiations have been stressing the crediting of all service (without any 30 year or similar limitation) for pension purposes, and for this reason we have not prepared any cost figures on such 30 year limitation type of plan.

Because of the distinct possibility that the unions may demand that all service, past and future, be credited, we are showing in the cost section of this report the cost figures for Plans A-1 and B-1 where the suffix "1" designates "future service only" and figures for Plans A-2 and B-2 where the suffix "2" designates "total service," future and past.

Also, it will be observed that in the detailed cost figures, the contribution requirements are set down separately for the hourly and the salaried groups of employees. This is done with the thought that you might wish to offer Plan type A-1 or B-1 (future service only) to the hourly group but Plan A-2 or B-2 (total service) to the salaried group as apparently has been the situation heretofore in the case of Can-Car.

We have been informed that the average rate of annual compensation for hourly employees at AVRO and Orenda Engines is about $4,000 per year. A 3/4% benefit accrual rate under Plan B would, therefore produce on the average $30 per year of credited service or $2.50 per month which amount compares favorably with the $2.25 rate found currently in many negotiated plans. The relatively small amount by which the $2.50 accrual rate exceeds the aforementioned $2.25 rate could be pointed to as an allowance to counteract the restriction of credited service to future service only. At the same time, it is not sufficiently greater than the $2.25 accrual rate to cause serious difficulties as a greater and greater proportion of total service falls into the category of future service. (Of course, it is not unlikely that future negotiations would result in an increase in the original $2.25 rate anyway and, quite frankly, we doubt if the unions would be satisfied initially with this rate of accrual, although we feel that the employer's deliberations should be directed to a reasonable level of benefits.)

One element that troubles us somewhat is this. In our analysis of the salaried employees (exclusive of the executive group), it appears that their average rate of compensation is somewhat less than $4,000, and, therefore, the Plan B monthly benefit accrual per year of credited service of the salaried group, determined at the 3/4% rate, would be less than the $2.50 amount (based on the $4,000 annual compensation rate) which the hourly employees would receive on the average. The $4,000 estimated average annual compensation level presumably includes overtime, shift premiums, etc., which "extras" are normally less likely to be earned by salaried employees.

In order to produce a rate of pension benefit accrual which might be more appropriate for both hourly and salaried employees, consideration might be given to using a 1% rate of benefit accrual for the basic plan in lieu of the 3/4% introduced in this report, but then define compensation as base compensation without overtime, shift premiums, etc.

If the incremental compensation (over and above base pay) for the hourly group amounts to 25% of the total compensation, then the 1% benefit accrual rate applied to base pay would be equivalent to the 3/4% rate applicable to total compensation. Such a benefit formula, utilizing base pay, might well give more equitable treatment to the two groups of employees than if total compensation were used.

As regards some of the detailed provisions of the proposed Plans A and B, the following general observations may be of interest.

Older Employees at Effective Date of Plan - In the formulation of a pension plan, the treatment of the presently older employees always requires special consideration. This is particularly the case where the plan covers future service only, since the presently older employees will have relatively little opportunity to accrue credited service after the effective date of the plan. Since it is not a good public relations policy to terminate employees at or past retirement age after a pension plan becomes effective without a reasonable amount of benefit, consideration might be given to the provision of a minimum pension, such as $15 or $25 a month. At the benefit accrual rate of 3/4% per year, the average employee (at least at AVRO and Orenda Engine) would accrue $2.50 per month per year of credited service. To accumulate a $15 benefit, service of 6 years would be necessary, or to accumulate $25, 10 years of service would be required. An approach to the minimum benefit might be to provide $25 a month to all employees in employment on the effective date of the Plan who retire with 5 or more years of credited service and let it be more or less tacitly understood that the present older employees with very short periods of service would be permitted to accumulate the minimum 5 years of credited service. Then, in the plan include a provision that employees hired after the effective date of the plan would not be entitled to any benefit unless they completed 10 years of credited service for which, of course, the minimum monthly benefit based on the aforementioned average rate of compensation (or it could be designated the actual minimum benefit if such approach is preferred) is $25.

The purpose of these minimum benefits is to avoid the situation where an employee with fairly long service is retired shortly after the plan becomes effective with credited service for only a very brief elapsed period between the effective date of the plan and his retirement date. For the employees newly hired at advanced ages, the situation is somewhat different since it can be made clear to them that as a condition of employment they are precluded from enjoying any benefit under the pension plan unless they put in the minimum number of years of credited service, such as 10 years. (The minimum period of service required of a newly hired employee in the future in order to establish a pension right should, of course, be also selected to be consistent with the minimum period of service required for vesting.)

Normal and Automatic Retirement Ages - It is customary to specify a normal retirement age in a pension plan, because this constitutes a bench-mark from which early or late retirement benefits may be measured. It is also the age at which, in some plans, the employer has the right to retire individual employees if he believes such course desirable.

An automatic retirement age is less frequently found, but is a desirable provision in a pension plan where the employer does not intend to review each of his employee's work capabilities at normal retirement date. It is the age to which an employee may presumably work if able to perform his duties satisfactorily, but to work beyond such age it is required that the employer give his specific permission.

As to the union attitudes towards the inclusion of an automatic retirement age, there seems to be some conflict. On one hand some union leaders seem to endorse the inclusion of this provision from the standpoint that increased mechanization (automation) makes it desirable even from the union's viewpoint, while on the other hand, other union leaders seem to hold that there should be no automatic retirement age.

Sometimes management, too will hold for the omission of an automatic age, taking the position that the older employee should be permitted to produce just as long as he can adequately fulfill the duties assigned to him. This position is a defensible one (particularly when well qualified employees are scarce) but, nevertheless, we feel that there is an element of protection to the employer in the stipulation of an automatic retirement age. If the employees are engaged in production line work, one individual who is not able to perform his functions efficiently may seriously cut down on the production of the whole group. On the other hand, if an automatic retirement age is specified the employer may still grant extensions for employees to work beyond that age where he feels clearly justified in so doing.

Early Retirement - Permitting an employee to retire before normal retirement age is customary. Sometimes early retirement is permitted only within a stipulated period before normal retirement date, such as 10 years. In other cases, it is permitted only after a specified age, such as age 60. In both cases, it is usual to also require that the retiring employee have a minimum of credited service, such as 10 years.

An actuarial reduction is usually applied so that the pension paid out immediately has a value equivalent to the pension accrued to date of retirement which would normally become payable at normal retirement date. In an increasing number of instances, however, a provision is found whereunder the pension is actuarially reduced only if the employee requests early retirement, and it is not reduced (but is payable at full accrued value) if the employer requests the employee to retire. We endorse this latter approach, because it facilitates an employer to retire older employees, say between age 60 and normal retirement age, when they are unable to adequately perform their duties even though not totally and permanently disabled.

Total and Permanent Disability Benefits - The selection of a suitable total and permanent disability benefit formula is difficult even when union negotiations are not an element influencing the determination of the benefit formula. In the Avro plan and the CSI plans (both for salaried employees), a total and permanent disability benefit equal to the actuarially reduced benefit accrued to date of disability retirement is granted (apparently regardless of the age of the employee and the duration of his employment). In the case of the Can-Car plan, there is no total and permanent disability benefit as such, although, of course, the early retirement benefit may serve as a form of total and permanent disability benefit to employees who are eligible for early retirement benefits (viz., within 10 years of normal retirement date).

Specific total and permanent disability benefits are becoming more generally found in pension plans. The inclusion of such benefits is almost certain to be a demand in any negotiations. Two types of benefit are frequently found: (a) The accrued benefit without actuarial reduction. (b) A rate of benefit accrual which is greater than the rate of accrual for age pension purposes - also without actuarial reduction.

<u>Death Benefits</u> - It will be observed that both of the illustrative plans make no provision for death benefits. If any death benefit is included the cost of a pension plan is increased accordingly. It is our opinion that normally a death benefit of any magnitude provided to active employees should be furnished through a group life insurance contract because of the geographical concentration of risk which arises whenever there is a group of active employees covered for death benefits. From the standpoint of costs (excluding from consideration administrative expense which is not a major item anyway), the addition of any form of death benefit to a pension plan would cost about the same in the long run as it would if it were handled entirely independently of the pension plan. The tax treatment afforded amounts payable on death favor the use of an insurance company's facilities. Consequently, there would seem to be little valid reason for including such a benefit in a pension plan.

It is true that some pension plans make available to employees certain death benefits before retirement and others provide a death benefit only after retirement, while still others provide some form of death benefits both before and after retirement. In negotiated plans, the death benefits for active employees are almost always handled outside of the pension plan. Where a death benefit is continued to retired employees, there, too, it is usually provided under the group life insurance policy, although in some instances a nominal death benefit (such as a flat $1,000 or the continuation of the pension benefit to a deceased employee's widow for a period of one year) is sometimes furnished through the pension plan. Since retired employees tend to be scattered somewhat more widely geographically than do active employees, there is not the same objection (deriving from geographical concentration of risk) to offering them a death benefit under a pension plan as in the case of active employees.

Level of Pension Benefits - It is generally held that for a pension plan to induce retirement at the appropriate time the general level of pension benefits (inclusive of any amounts payable from governmental sources but exclusive of amounts established by an employee outside of his pension plan coverage) should be not less than 50% of the rate of pay enjoyed at or near retirement. For employees with less than a full complement of service (say 30 years), this benefit level may be reduced more or less proportionately merely because an employer's responsibility to his older employees is somehow related to their length of service. For employees in the lower earnings brackets with long service, a moderately higher percentage of compensation such as 60% or even 70% may be desirable to provide a pensioner with the necessities of life. Also, where an employee makes a relatively high level of contributions to a pension plan, his benefits are properly higher than if the plan should be non-contributory.

Furthermore, where an employee accumulates benefit accruals under a pension plan based on each year's service with his employer, the percentage accrual rate may quite properly be higher than if the plan utilized final average pay as a basis for determining benefits (since such final average pay will most likely exceed career average pay).

The gist of these comments is that the Basic Pension Plans A and B will need to be supplemented through rather sizeable additional pension benefit increments, the magnitude of which should be in some measure related to (i) length of participation, or of service, at retirement, (ii) whether the benefits are based on career or final average pay levels, (iii) the broad salary levels of the employees covered, and (iv) the relative magnitude of the employees' contributions under such supplementary plan. Generally speaking a total pension benefit accrual rate (basic plan plus supplementary plan) of not less than 1-1/2% of each year's pay should be offered with a reasonable part of the total benefit to be conditioned on and met by employee contributions.

SECTION III. Supplementary Pension Plan (Based Partly or Entirely on Employee Contributions)

A provision in a pension plan under which the employee is required or permitted to make contributions is a departure from the concept of a pension as being a deferred wage. Such contributions are a form of personal savings and should be regarded as such. The particular attraction in Canada of the contributory form of pension plan lies in the tax deferment on such contributions under the Income Tax Act. This makes participation in a contributory plan, particularly for those in higher income brackets, the cheapest form of saving available.

The modern economic theory of a pension as a deferred wage when supported only by employer contributions has tended to obscure the arguments in favor of joint contributory plans.

The concept of a contributory pension plan as being a joint venture of the employer and employee to provide for the future welfare of the latter still obtains. Furthermore, many students of pension matters hold that contributory plans do assist employer-employee relations. Until the advent of labor union negotiated plans, a noncontributory pension plan was the exception in Canada.

The tax incidence of employee contributions involve consideration of the provisions of the Income Tax Act which are expressed in very ambiguous language.

Section II, subsection (1), paragraph (i), subparagraphs (i) and (ii) read in part as follows:

11. (1) "the following amounts may be deducted in computing the income of a taxpayer for the taxation year:

(i) amounts contributed by the taxpayer to or under a registered fund or plan,

(i) not exceeding in the aggregate $1,500.00 in the year if retained by his employer from his remuneration for or under the fund or plan in respect of services rendered in the year . . . . . and

(ii) not exceeding in the aggregate $1,500.00 paid in the year into or under the fund or plan by the taxpayer in respect of services rendered by him previous to the year while he was a contributor."

This language has been interpreted by the tax department to permit a tax deferment of the required contribution under a pension plan for future service to the extent that it does not exceed $1,500.00. A further amount equivalent to the required rate of contribution for future service applied to the total earnings received prior to becoming a contributor under the Plan and deductible at the rate of not more than $1,500.00 a year until exhausted, may be contributed in respect of prior service.

Owing to the difficulty of ascertaining past earnings, the tax department ruled that in lieu of the past service deduction by the employee, they would permit increased future service deductions up to $1,500.00 a year based on the following table.

Age	Maximum Rate of Contribution
Under 20 years	5%
20 - 24	6%
25 - 29	7½%
30 - 34	9%
35 - 39	11%
40 - 45	13%
Over 45	15%

The maximum contribution must not exceed the lesser of $1,500.00 or 15% of earnings. The maximum rate of contribution at entry is the maximum rate of deduction during employment.

An employee must retain a fully vested right to his own contributions. To the extent that they exceed the required contribution under a contributory plan or the total contribution under a noncontributory plan, they are to be used to produce additional pension benefits at retirement. In order to avoid having the employer attempt to provide any pension benefit in the form of an annuity from these employee contributions, the contributions can either be invested in an annuity contract issued by an insurer, or deposited in a separate account with a trustee and ultimately applied as the premium on an annuity contract.

If insured contracts are used as a funding medium, the ideal vehicle is an annuity contract on a money-purchase basis of the type which is available from the Annuities Branch of the Department of Labour. However, the government annuities have some statutory limitations, such as lack of cash surrender values, which make them undesirable. Contracts similar to those offered by the Annuities Branch are not generally available from regular insurers. If a trusteed fund is adopted, consideration can also be given to permitting the employee to elect to have his contributions invested in a diversified trust composed of:

(i) government or municipal obligations only, or

(ii) industrial bonds or preferred stocks only, or

(iii) equities only, or

(iv) a combination of the above.

The purpose of using such a diversified trust is to improve the earnings.

At retirement, the value of the total contributions converted into cash would be applied as the premium on an immediate annuity contract of which the employee must be the beneficiary. Upon early separation, the choice is available of electing a cash refund or of allowing the investment to stand until retirement age, or purchasing a deferred annuity.

Below is a draft of a provision incorporating a Trusteed Supplementary Plan providing for contributions by employees:

An employee may elect to contribute under this Plan. Such election shall be in writing and shall authorize the required contributions to be deducted from his remuneration. The amount so authorized will be expressed as a percentage of the remuneration, and once authorized, may not be changed except as of the first of each calendar year by notice in writing given at least one month prior to the end of such calendar year.

The amount to be contributed shall not be less than 5% of the remuneration of the employee and may be increased in accordance with the following table:

Age	Maximum Rate of Contribution
Under 20 years	5%
20 - 24	6%
25 - 29	7-1/2%
30 - 34	9%
35 - 39	11%
40 - 45	15%
Over 45	15%

The amount so contributed is deductible in determining income subject to tax under the Income Tax Act to the extent that it does not exceed $1,500.00 in any one year.

The contributions shall be paid over to the Trustees to be held and invested by them. In investing such monies, the employee may direct, by notice in writing addressed to the Trustees, that his contributions will be invested as follows:

(1) By applying the total contributions as the premium on an annuity contract issued by an insurer, and of which the Trustees shall be the purchaser and owner, the employee being the beneficiary on a life contingency basis. Such contract shall not contain any loan values but may,

(a) contain a guarantee that the payments will continue for a period certain not greater than 10 years or for life, whichever is longer, or

(b) provide that upon the death of the employee as a primary annuitant, the payments will continue to a surviving contingent annuitant, and such contract may be guaranteed for a period certain not in excess of 10 years.

(2) By investing the contributions either separately or in a common or pooled fund, the investments of which shall consist solely of,

(a) bonds or debentures of or guaranteed by Canada, or any province thereof, or of any municipality or school board therein, or

(b) bonds, debentures, preferred stocks and other obligations of companies incorporated and/or carrying on business in Canada having a fixed rate of earnings and which is payable in Canadian dollars, or

(c) ordinary or common stock of companies in Canada and listed on a recognized stock exchange in Canada, or

(d) partly in government or municipal bonds, partly in corporation fixed income obligations and partly in common or ordinary shares, all of which pay interest or dividends in Canadian dollars.

An election made by an employee may be changed as may be agreed upon with the Trustees.

If an employee leaves the employment, he shall receive

(a) If he has elected to have his contributions applied as the premium on an insured contract, the contract or contracts so purchased, assigned by the Trustees and surrendered to him,

(b) If he has elected to have his contributions invested in a fund, he shall be paid by the Trustees in a lump sum, the value of his contributions and earnings thereon as determined by the Trustees as at the date of leaving the employment and which determination shall be conclusive.

An employee shall at all times have a fully vested right to the contributions made by him, or to the property or portion thereof in which such contributions are invested. An employee may not withdraw, assign, pledge, encumber or borrow against the monies so contributed while he remains in the employment.

Upon an employee attaining retirement age and retiring, the Trustees shall,

(a) if the contributions have been applied to an insurance contract, assign and surrender to the employee the contract or contracts to which such contributions have been applied,

(b) if the contributions have been invested, to determine the amount to which the employee is then entitled. Such amount must then be realized in cash and applied by the Trustees as the single premium on an annuity contract issued by an insurer in Canada.

Such contract shall have the employee as the primary annuitant on a life contingency basis and it may,

(i) be guaranteed for a period certain not in excess of 10 years or for life, and

(ii) provide for payments in the same or a reduced amount to continue after the employee's death to a surviving contingent annuitant.

<u>Supplemental Plans for Basic Plans A and B</u> - Next, consider the design of specific supplemental pension plans to use in conjunction with the illustrative Basic Pension Plans A and B.

Basic Plan B provides for a noncontributory benefit of 3/4% of each year's compensation. Accordingly, if the desire is to provide a total pension accrual rate of 1-1/2% of each year's compensation, it would be merely necessary to offer an additional 3/4% of each year's compensation under a supplementary plan on a contributory basis. In view of the favorable tax treatment afforded employee contributions in Canada and because of the level of benefits offered by other employers, we would recommend that the supplementary contributory benefit be set at 1% so that the total benefit accrual is 1-3/4%. The rate of employee contribution under the supplementary plan could be set at 5% of compensation. 1/

It is presumed that the Supplemental Plan to Basic Plan B would also make provision for additional employee contributions to be made on a voluntary basis (up to the maximum amounts which may be treated as tax deductible) with additional benefits being provided with such contributions on a money purchase basis.

Basic Plan A provides a $2.25 monthly benefit for each year of credited service. Here a suitable supplementary pension plan would probably be a little more complex than that which would be suitable to offer as a supplement to Basic Plan B.

If the employer may be deemed willing under Plan B to provide a noncontributory pension benefit of 3/4% of compensation then it could be held that he should be amenable to provide a supplementary contributory benefit devised as follows:

1/ At the very youngest ages of hire, a 5% employee contribution could be more than adequate to pay for a 1% benefit with retirement commencing at age 68. However, this envisions the employee's compensation remaining level throughout his entire active working period. With any reasonable amount of increase in compensation levels over the employee's working years, the employee's 5% contributions would not be adequate to provide the 1% rate of benefit.

Since \$2.25 is equivalent to 3/4% of \$300 of monthly compensation, then the supplemental benefit might be of the form of 3/4%, or alternatively 1%, of the first \$3,600 of annual compensation for each year of credited service and 1-1/2%, or 1-3/4%, of compensation in excess of such \$3,600 of annual compensation.

Preferring, as was indicated above, the 1-3/4% rate of total benefit accrual rather than the 1-1/2% rate, we would propose the supplemental plan for Basic Plan A be 1% of the first \$3,600 of annual compensation with an employee contribution of 3% of the first \$3,600 of his annual compensation plus 1-3/4% of the annual compensation in excess of \$3,600 with an employee contribution rate of 5% on such excess annual compensation.

Again we presume that the supplemental plan to Basic Plan A would permit an employee to elect to make additional contributions up to the maximum tax deductible amount with additional supplemental benefits being provided by their contributions on the money purchase basis.

For the purpose of illustrating the benefits which would arise under the noncontributory Basic Plans A and B and under the Supplementary contributory plans outlined above, there is set out (on the following page) the benefits which would develop for certain employees with the indicated rates of compensation and periods of future service coverage. The limitations of any such table of illustrative pensions must be borne in mind. The assumption of level monthly pay is highly academic. The table may, however, be of some value in comparing the relative magnitude of benefits under the two basic plans and the indicated supplementary plan. As is quite apparent, the Basic Plan A plus Supplementary Plan A provide identically the same retirement benefits as does Basic Plan B plus Supplementary Plan B, where the amount of monthly salary is \$300.00 or more. 1/ Of course, the noncontributory and contributory components of the two Plans are quite different.

1/ In some cases there is a \$1.00 difference in the table, owing to rounding.

Illustrative Monthly Pension Benefits

Illustrative Basic and Supplementary Plans

Level Monthly Compensation	Employee Hired 25; Retirement Age 68		Employee Hired 35; Retirement Age 68		Employee Hired 45; Retirement Age 68	
	Plan A-1 $2.25 Basic	Plan B-1 3/4% Basic	Plan A-1 $2.25 Basic	Plan B-1 3/4% Basic	Plan A-1 $2.25 Basic	Plan B-1 3/4% Basic
$ 200.00						
Basic	$ 97	$ 65	$ 74	$ 50	$ 52	$ 35
Supplementary	86	86	66	66	46	46
Total	$183	$151	$140	$116	$ 98	$ 81
Employee Mo. Contribution	$ 6.00	$ 10.00				
$ 350.00						
Basic	$ 97	$113	$ 74	$ 87	$ 52	$ 60
Supplementary	167	151	128	116	89	81
Total	$264	$264	$202	$203	$141	$141
Employee Mo. Contribution	$ 11.50	$ 17.50				
$ 500.00						
Basic	$ 97	$161	$ 74	$ 124	$ 52	$ 86
Supplementary	280	215	215	165	150	115
Total	$377	$376	$289	$289	$202	$201
Employee Mo. Contribution	$ 19.00	$ 25.00				
$1,000.00						
Basic	$ 97	$323	$ 74	$248	$ 52	$173
Supplementary	656	430	503	330	351	230
Total	$753	$753	$577	$578	$403	$403
Employee Mo. Contribution	$ 44.00	$ 50.00				

Plan A: Basic - $2.25 per month times number of years of credited future service. Supplementary - One-twelfth of 1% of the first $3,600 of each year's compensation plus 1-3/4% of each year's compensation in excess of $3,600. Employee Contribution - 3% of first $3,600 of each year's compensation and 5% of excess.

Plan B: Basic - 3/4% of average monthly compensation times number of years of credited service. Supplementary - One-twelfth of 1% of compensation for each year of credited service. Employee Contribution - 5% of each year's compensation.

Over the last decade or two a significant inflationary trend has been in evidence. As a result, employees covered under a career average type of pension plan (as opposed to a final average type of plan) receive pension benefits which are inadequate when related to the compensation earned at or near retirement. Accordingly, some pension plans have been amended to base benefits on the average compensation earned over, say, the last 5 or 10 years prior to retirement.

Plans A and B are both of the career average type and, therefore, they may be productive of benefits which appear satisfactory when expressed in terms of career average pay but are actually low when related to final average compensation rates. To "correct" this possibility, some employers have inserted in their plans a provision to the effect that a minimum benefit equal to, say, 37-1/2% of final average pay (average for last 5 years, say) will be payable to all employees who retire with 30 or more years of credited service (where such service is less than 30 years a pro rata reduction is effected in the 37-1/2% figure).

While we do not believe that this is the time to consider such details of a plan as this, it is nevertheless a provision which we believe should be borne in mind for possible consideration in the future as the design of the pension program becomes more definite.

SECTION IV. Costs of Basic Pension Plans

General - Part of our assignment was to determine the first year contribution requirements of an illustrative pension plan which, in our opinion, would be appropriate for the employees of the subsidiaries of A. V. Roe Canada Limited. In order to facilitate the calculation of pension plan costs for a variety of benefit accrual rates, we have computed costs for four "unit" plans. These plans are designated "A-1" and "A-2" (of the same type as Basic Plan A discussed in Section II above), and provide for a benefit accrual of $1.00 per month per year of credited service. Plan A-1 provides benefits in respect of future service only, the plan discussed in Section II, and Plan A-2 provides benefits for both future service and past service. (This Plan A-2 modification has been included to indicate the added cost of defining credited service to cover all service since this may well be the basis of the union's demand.) Then, costs are also shown for Plans B-1 and B-2 (of the same type as Plan B discussed in Section II) which provide for a benefit accrual rate of 1% of annual pay. Plan B-1 provides benefits in respect of future service only and Plan B-2 provides for future service and past service combined.

Valuations were made for each of these four unit plans on the basis of a 3-1/2% interest rate and again at a 4% interest rate. Insofar as hourly employees were concerned, we assumed an average retirement age of 68, but feeling that salaried employees might tend to retire at a somewhat earlier date on the average, we have used average retirement age of 65 in valuing the benefits of salaried employees.

All plans assume liberal vesting and a modest disability benefit (payment of full accrued benefit at disability without actuarial reduction).

Table 1 shows the total number of employees for each subsidiary and within subsidiary by hourly employees and by monthly and weekly paid salaried employees; this is a summary of the employment level taken around November and December of 1956.

However, costs were determined from detailed data as mentioned in the Appendix and were then adjusted to reflect the employment levels in Table 1. The detailed employee data submitted for valuation purposes were consistent with the number of employees contained in the summary except in the case of CanCar salaried. Detailed data were submitted on 2,173 salaried employees, as compared with 1,000 employees in the earlier summary. Accordingly, in Table 1 we have increased the number of CanCar salaried employees to 2,173 and this increases the total number of employees for which we are setting out cost figures from 19,259 on the original summary to 20,422. A tabulation of the detail employee data that was furnished to us is contained in Exhibit 1 of the Appendix of this report.

Exhibits 2 and 3 in the Appendix show the estimated costs of the four illustrative unit plans by subsidiary based on the detailed data; the cost figures in Exhibit 2 being based on 3-1/2% interest and those in Exhibit 3 on 4% interest. This Appendix also contains a brief outline of the actuarial factors (Exhibit 4) assumed in valuing the Basic Plans A and B, and an outline of certain noncontributory (Exhibit 5(a)) and contributory pension plans (Exhibit 6(a)) of other companies, together with illustrative benefits payable at age 65 (Exhibits 5(b) and 6(b), respectively).

After first computing costs for the employee data submitted to us, as set out in detail in Exhibits 2 and 3 of the Appendix, we next adjusted these Exhibit 2 and Exhibit 3 costs to produce the costs per unit of benefit for the summary employee data; these unit cost figures are set out according to subsidiary in Tables 3 and 4 of this report. Finally, we obtained estimated costs for Plans A ($2.25 basis) and B (3/4% basis) for each subsidiary by prorating the figures in Tables 3 and 4 to conform to the benefit levels of the proposed Basic Plans A and B and these results are summarized in Table 2. This rather complete detailed information relative to the initial annual costs has been included in the report just in case it develops that certain alterations should be made in the employee data.

Commentary on Costs:

First Year Costs of All Four Unit (Basic) Plans Being Valued - Tables 3 and 4 show the estimated costs by subsidiary of the four unit plans being valued - Table 3 assuming 3-1/2% interest and Table 4 assuming 4% interest. It will be observed that except for CanCar for the $1 unit of benefit type, future service only (Unit Plan A-1), the costs are not significantly different for the Hourly and Salaried employees. The inclusion of past service (Unit Plan A-2) increases unit costs by about 25%.

In the case of the 1% plan (Unit Plan B-1), the costs for the salaried group are significantly higher (between 10% and 20% higher) than for the Hourly group for either Plan B-1 (future service only) or Plan B-2 (past and future service). Again the extension of the period of credited service to include past service increases the costs (Plan B-2 and Plan B-1) by roughly 25%.

The costs for the plans discussed earlier in the report (i.e., Plan A, a flat benefit of $2.25 per month per year of service, and Plan B, a plan providing 3/4 of 1% of average pay per year) are summarized in Table 2. While at a $3,600 level of compensation the rate of benefit accruals under both plans is the same, it is apparent that the lower cost of the 3/4% benefit on compensation under $3,600 is more than offset by the higher costs of the 3/4% benefit on pay in excess of $3,600 per year. If a 3-1/2% interest rate valuation assumption were used for Basic Plan A ($2.25 monthly per year of credited service), the estimated initial annual contribution requirement runs to about 2.97% of the hourly payroll and 3.19% of the salaried payroll.

For Plan B (3/4% benefit), the initial annual costs run about 3.18% of hourly payroll and 3.69% of salaried payroll.

If circumstances should justify the adoption of a 4% interest assumption, the contributions for Plan A would be reduced by about 9% from the 3-1/2% assumption figure, while for Plan B they would be reduced about 11%.

Comparison with General Motors Canadian Hourly Plan - As mentioned in our earlier report, we made a rough determination of the first year contribution requirement for the hourly employees of Avro and Orenda Engines combined, according to the Pension Plan for Hourly-Rate Employees of Canadian Subsidiaries of General Motors Corporation. (For an outline of this Plan, see Exhibit 5(a) of the Appendix.) On the basis of this calculation, we find that the General Motors Canadian Hourly Plan would cost almost 25% more than a flat benefit of $2.25 per month (which is also 3/4 of 1% of the average monthly pay of $333.33 assumed for Avro and Orenda hourly employees).

First Year Costs for Supplementary Plans - No detailed costs for the proposed Supplementary Plans have been prepared for this report. A rough estimate of the cost of Supplementary Plan B has been derived from the Basic Plan B costs as follows. The Basic Plan B provides a 3/4% rate of benefit on all pay and the proposed Supplementary part of Plan B provides a 1% rate of benefit with an employee contribution of 5%. Taking into consideration the fact that the employee contributions would be returned in the event of death or termination of employment, so that they will not "go as far" in providing pension benefits as would an equivalent amount of employer contributions, we find, assuming all employees were to participate in the Supplementary Plan, that the initial annual cost (on the 3-1/2% interest assumption) to the employer of this Supplementary Plan (Future Service only) would be about $700,000, or less than 1% of payroll. Adding in the initial annual cost of Basic Plan B produces an estimated total employer cost, for the 1-3/4% rate of benefit accrual, assuming the employees contribute at the 5% rate, of roughly $3,500,000, or about 4-1/4% of payroll.

Table 1

A. V. ROE CANADA LIMITED

Census by Subsidiary of Employment, December, 1956

			Salaried		
	Total	Hourly	Monthly	Weekly	Total
Avro Industries Limited	58	-	28	30	58
Avro Aircraft Limited	8,440	4,918	694	2,828	3,522
Orenda Engines Limited	5,397	3,038	445	1,914	2,359
Canadian Steel Improvements	329	205	42	82	124
Can-Car	3,725	2,725	250 *	750 *	1,000
Canadian Steel Foundries	1,300	1,122	83	95	178
Total:	19,249	12,008	1,542	5,699	7,241
Additional Can-Car Salaried employees in data submitted	1,173				1,173
	20,422				8,414

* Data submitted for valuation purposes comprised 2,173 salaried employees and this figure has been used.

A. V. ROE CANADA LIMITED

Table 2

Summary of Estimated Contribution Requirements for Illustrative Plans - Future Service Only

Costs for Unit Benefit Plans Based on Census Data Supplied Adjusted (Pro Rata on Number of Employees) to Include All Employees

Subsidiary and Class of Employees	Number of Employees	PLAN A Flat $2.25 per Month per Year of Service Contribution Requirement Amount	PLAN A % of Pay	PLAN B Benefit of 3/4 of 1% of Average Pay For Each Year of Service Contribution Requirement Amount	PLAN B % of Pay
			On Basis of 3-1/2% Interest Rate		
Hourly Employees					
Avro Aircraft Limited	4,918	$ 536,000	2.72%	$ 595,700	3.03%
Orenda Engines Limited	3,038	331,200	2.72	368,000	3.03
Canadian Car & Foundry Co., Limited	2,725	371,500	3.75	365,000	3.69
Total	10,681	$1,238,700	2.97%	$1,328,700	3.18%
Other Hourly 1/	1,327	-	-	-	-
Grand Total 2/	12,008	$1,393,000	2.97%	$1,494,000	3.18%
Salaried Employees					
Avro Aircraft Limited	3,522	$ 433,800	2.80%	$ 546,600	3.53%
Orenda Engines Limited	2,359	294,300	2.87	368,900	3.60
Canadian Car & Foundry Co., Limited 3/	2,173	325,600	4.45	305,300	4.17
Total	8,054	$1,053,700	3.19%	$1,220,800	3.69%
Other Salaried 1/	360	-	-	-	-
Grand Total 2/	8,414	$1,101,000	3.19%	$1,275,000	3.69%
			On Basis of 4% Interest Rate		
Hourly Employees					
Avro Aircraft Limited	4,918	$ 483,300	2.46%	$ 537,200	2.73%
Orenda Engines Limited	3,038	298,600	2.46	331,900	2.73
Canadian Car & Foundry Co., Limited	2,725	343,100	3.46	336,500	3.40
Total	10,681	$1,125,000	2.70%	$1,205,600	2.89%
Other Hourly 1/	1,327	-	-	-	-
Grand Total 2/	12,008	$1,265,000	2.70%	$1,355,000	2.89%
Salaried Employees					
Avro Aircraft Limited	3,522	$ 381,200	2.46%	$ 482,000	3.11%
Orenda Engines Limited	2,359	259,000	2.53	325,900	3.18
Canadian Car & Foundry Co., Limited 3/	2,173	291,600	3.99	273,500	3.74
Total	8,054	$ 931,800	2.82%	$1,081,400	3.27%
Other Salaried 1/	360	-	-	-	-
Grand Total 2/	8,414	$ 973,000	2.82%	$1,130,000	3.27%

1/ These are employees shown in Table 1 for which we did not receive any detailed data for valuation purposes.
2/ Graded on number of employees. (For % of pay figures this assumes these employees receive average compensation equal to average for all other salaried or hourly employees.)
3/ Based on the number in the data sent for valuation purposes and not from the summary of data originally submitted to us.

Table 3

A. V. ROE CANADA LIMITED

Cost Estimates of Illustrative Pension Plans By Subsidiary
3-1/2% Interest Basis

	Avro Industries Limited	Avro Aircraft Limited		Orenda Engines Limited		Canadian Steel Improvements		Canadian Car & Foundry Company Limited		Canadian Steel Foundries	
	Monthly & Weekly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees
I. Census Data											
1. Number of Employees	58 1/	3,522	4,918	2,359	3,038	124 1/	205 1/	2,173 2/	2,725	178 1/	1,122 1/
2. Annual Pay		$15,477,700	$19,672,000	$10,250,800	$12,152,000			$7,315,900	$9,902,000		
3. Average Annual Pay		4,395	4,000	4,345	4,000			3,367	3,634		
II. A-1 Type Benefit of $1.00 a month per year of service - Future Service Only											
1. Average Annual Benefit Per Employee		$ 363	$ 339	$ 356	$ 339			$ 265	$ 253		
2. First Year Cost	NOT	192,800	238,200	130,800	147,200			144,700	165,100		
3. First Year Cost as % of Pay	AVAILABLE	1.25%	1.21%	1.28%	1.21%			1.98%	1.67%		
III. A-2 Type Benefit of $1.00 a month per year of service - Past and Future Service											
1. Average Annual Benefit Per Employee		$ 416	$ 400	$ 413	$ 400						
2. First Year Cost	NOT	237,300	301,200	162,800	186,000	NOT AVAILABLE		3/	4/	NOT AVAILABLE	
3. First Year Cost as % of Pay	AVAILABLE	1.53%	1.53%	1.59%	1.53%						
IV. B-1 Type Annual Benefit Accrual of 1% of Annual Pay - Future Service Only											
1. Average Annual Benefit Per Employee		$ 1,270	$ 1,131	$ 1,220	$ 1,131			$ 738	$ 802		
2. First Year Cost	NOT	728,800	794,200	491,900	490,600			407,000	486,700		
3. First Year Cost as % of Pay	AVAILABLE	4.71%	4.04%	4.80%	4.04%			5.56%	4.92%		
V. B-2 Type Annual Benefit Accrual of 1% of Annual Pay - Past and Future Service											
1. Average Annual Benefit Per Employee		$ 1,495	$ 1,332	$ 1,460	$ 1,332						
2. First Year Cost	NOT	919,300	1,004,300	628,400	620,400			3/	4/		
3. First Year Cost as % of Pay	AVAILABLE	5.94%	5.11%	6.13%	5.11%						

1/ No data was sent regarding these subsidiaries.

2/ Since data submitted for cost estimates showed 2,173, although count of salaried employees on listing of subsidiaries showed only 1,000, we based these figures on the larger number.

3/ No past service data available for 1,865 participants included in this group but costs for non-participants were about 50% higher than for A-1 Type Plan and 60% higher for B-2 Type Plan.

4/ No past service data available for 998 participants included in this group but costs for non-participants were about 45% higher than for A-1 Type Plan and B-2 Type Plan.

Table 4

A. V. ROE CANADA LIMITED

Cost Estimates of Illustrative Pension Plans By Subsidiary
4% Interest Basis

	Avro Industries Limited	Avro Aircraft Limited		Orenda Engines Limited		Canadian Steel Improvements		Canadian Car & Foundry Company Limited		Canadian Steel Foundries	
	Monthly & Weekly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees	Monthly & Weekly Paid Employees	Hourly Paid Employees
I. Census Data											
1. Number of Employees	58 1/	3,522	4,918	2,359	3,038	124 1/	205 1/	2,173 2/	2,725	178 1/	1,122 1/
2. Annual Pay		$15,477,700	$19,672,000	$10,250,800	$12,152,000			$7,315,900	$9,902,000		
3. Average Annual Pay		4,395	4,000	4,345	4,000			3,367	3,634		
II. A-1 Type Benefit of $1.00 a month per year of service - Future Service Only											
1. Average Annual Benefit Per Employee		$ 363	$ 339	$ 356	$ 339			$ 265	$ 253		
2. First Year Cost	NOT	$ 169,400	$ 214,800	$ 115,100	$ 132,700			$ 129,600	$ 152,500		
3. First Year Cost as % of Pay	AVAILABLE	1.09%	1.09%	1.12%	1.09%			1.77%	1.54%		
III. A-2 Type Benefit of $1.00 a month per year of service - Past and Future Service											
1. Average Annual Benefit per Employee		$ 416	$ 400	$ 413	$ 400		NOT AVAILABLE	3/	4/		NOT AVAILABLE
2. First Year Cost	NOT	$ 210,000	$ 273,400	$ 144,200	$ 168,900						
3. First Year Cost as % of Pay	AVAILABLE	1.36%	1.39%	1.41%	1.39%						
IV. B-1 Type Annual Benefit Accrual of 1% of Annual Pay - Future Service Only											
1. Average Annual Benefit Per Employee		$ 1,270	$ 1,131	$ 1,220	$ 1,131			$ 738	$ 802		
2. First Year Cost	NOT	$ 642,700	$ 716,300	$ 434,500	$ 442,500			$ 364,700	$ 448,700		
3. First Year Cost as % of Pay	AVAILABLE	4.15%	3.64%	4.24%	3.64%			4.99%	4.53%		
V. B-2 Type Annual Benefit Accrual of 1% of Annual Pay - Past and Future Service											
1. Average Annual Benefit per Employee		$ 1,495	$ 1,332	$ 1,460	$ 1,332			3/	4/		
2. First Year Cost	NOT	$ 815,700	$ 911,400	$ 551,000	$ 563,000						
3. First Year Cost as % of Pay	AVAILABLE	5.27%	4.63%	5.38%	4.63%						

1/ No data was sent regarding these subsidiaries.

2/ Since data submitted for cost estimates showed 2,173, although count of salaried employees on listing of subsidiaries showed only 1000, we based this figure on the larger number.

3/ No past service data available for 1,865 participants included in this group but costs for non-participants were about 50% higher than for A-1 Type Plan and 60% higher for B-2 Type Plan.

4/ No past service data available for 998 participants included in this group but costs for non-participants were about 45% higher than for A-1 Type Plan and B-2 Type Plan.

SECTION V - Integration of Present Pension Plans with Proposed Basic and Supplementary Plans

You have requested our views on the problem of integrating the present pension plans with the proposed Basic and Supplementary plans. The present plans of which we have been informed cover the hourly group in Canadian Car and Foundry Company, Limited (CanCar), and the salaried groups in CanCar, Avro Aircraft Company, Limited (Avro), and Canadian Steel Improvement Limited (C.S.I.). Of these four groups, the CanCar pensions for both wage and salaried employees are funded under a trust fund established with the Montreal Trust Company. The salaried group of Avro and C.S.I. are funded under a group annuity contract with the Norwich Union Life Insurance Society.

It is presumed that no further benefits will accrue under the present plans and that benefits heretofore accrued under the existing plans will stand to the credit of the employees; furthermore, that such accrued benefits will be in addition to the benefits provided in respect of service subsequent to the effective date of the proposed general Basic and Supplementary plans. It would therefore be necessary to determine for each present participant his accrued benefit under the present plan as of the effective date of the new plan. Such accrued benefit would be granted in addition to the benefits under the new plan and to the extent not yet paid for would represent a continuing liability to be provided for with employer contributions in some orderly manner in the future. With respect to credited service after the effective date of the new plan the benefits would be only those under the new plan.

General - It should be pointed out that many of the "accrued benefits" will carry with them vesting rights and certain death benefit features which provide for a return of employee contributions (it is assumed that any group life death benefit such as in the C.S.I. plan will in the future be handled outside of the pension plan).

There are two principal ways to handle these accrued benefits. If a new carrier (trust or insurance company) is utilized one way is to transfer the accrued benefits over to the new carrier. There will be no problem in transferring for the trusteed plans. But, transferring (i.e., cashing out) insured contracts do present certain difficulties. The insurer will have to agree to cashing out the benefits and if it does it may impose a surrender charge of from, say, 4% to 5% which would constitute an added expense to the plan; it may also insist upon signed waivers from the employees to protect itself against any future claims. (It would also probably be advisable in any event to get a signed approval from each employee if accrued benefits are to be cashed out and turned over to a new carrier.

Another way is to transfer only the trusteed benefits but to place the insured accrued benefits in a paid-up status, subject to the provisions of the existing plan. Group annuity contracts generally provide that all purchased benefits will vest upon discontinuance of the contract. It would therefore be necessary to amend the group annuity contract to make these paid-up benefits conform to the accrued benefits of the plan. Also, the group annuity contract should be amended to permit any future credits (termination of employment, etc.) on these paid-up benefits to be credited to the employer and applied toward the payment of premiums falling due under the new plan.

There is only one hourly contributory plan at the present time and that is under CanCar. It may be felt that for the sake of uniformity for hourly employees, it is not particularly desirable to keep these accrued benefits in force. An alternative would then be to cash them out completely and to pay the cash to the employees. The minimum amount that could be paid to the employees is the contributions paid to date, and we would suggest the "with interest" basis. The maximum that could be paid is the reserve value of their accrued benefits. For various reasons we think that it might be desirable to pay over this maximum value, which includes the company contributions. If this appears too drastic, another way is to pay the employees their contributions immediately, and upon meeting the vesting requirements or in the event of prior death to pay the difference between what they were paid and the reserve value. There is a provision in the Income Tax Act (Section 36) permitting amounts so refunded in cash to be taxed at the reduced rate set out in that Section. This could, therefore, offer a method to be used to effect general uniformity and to establish at least for all hourly employees the "future service only" principle.

Eligibility

Hourly-Paid Employees - Under the CanCar Plan, there is a waiting period of three years. The proposed plan calls for immediate participation or for a waiting period of three months. There would be no problem as regards eligibility period if the new plan is noncontributory.

Salaried Employees - Participation is optional for the employees of CanCar at the effective date (June 1, 1954), compulsory for all employees hired thereafter who meet the requirements. Participation is voluntary for employees of Avro and C.S.I. who meet the requirements. There would not seem to be any difficulty in reconciling any presently existing differences.

Retirement Date - In all the presently existing plans, the normal retirement date is age 65 for men and age 60 for women. There is also a uniform provision for early retirement within 10 years prior to normal retirement and another provision for late retirement. In the event of deferred retirement, contributions are not made and benefits do not accrue.

In the illustrative plans, assumed retirement is at age 68.[1] There is, therefore, a general conflict which may cause difficulty. In the case of an employee who has contributed under a joint contributory plan, there may be some basis for his thinking that he has a right to be retired not later than age 65 with a full pension. This may be particularly true in the case of women who expect to retire at age 60.

1/ For Hourly Employees.

One solution is to preserve the retirement dates established under the present plans for present participants, and to have the retirement dates of the new plan apply only to new participants. This approach is rather arbitrary and seemingly awkward.

An approach which we have used in other situations where the normal retirement dates have been changed is to continue the old retirement age basis with respect to pension benefits accrued up to the date of amendment, and to have the new retirement age basis apply to all benefits accruing by reason of service after the effective date of the amended plan. An illustration may be helpful. Suppose the original plan provided that women would retire normally at age 60 while the amended plan provides a normal retirement age of 68, and that a woman continues to work until age 63 at which age she retires. Her benefits accrued prior to the date of the amendment would be paid either in full or on an actuarially increased basis, according as the plan provides, while the benefits accrued subsequent to the date of the amendment on the retirement age 68 basis would be actuarially reduced to the age 63 equivalence. (This, of course, assumes that the plan requires such actuarial reduction. If the plan provided that where an employee retired after age 60 at the employer's request the full accrued benefits would be paid, without actuarial reduction, then the full benefit accrued subsequent to the date of amendment would be payable without actuarial reduction).

Another possibility is to permit the employee to elect whether to continue under the old plan or to accept the new one. This raises serious administrative problems in that it involves keeping the terms of the present plan in effect for an indefinite time but without any change, and it would lead to employee dissatisfaction if, having elected the old plan, he found out later that the new plan would have been better for him.

Finally, it is possible to provide that the retirement date under the present plans would be applicable only to all participants now, say, 50 years of age or older; for the others, the terms of the new plan would prevail. However, this makes for a rather arbitrary separation point at a specific age and therefore might not be too well received by the employees; also it might require an employee's written approval where his retirement age would be changed.

We recommend, therefore, that the present retirement dates apply for all benefits accrued to date but that the new retirement ages apply for all benefits accruing in the future.

Vesting - The vesting clause in the proposed Plan B of 50% after the fifth year, increasing by 10% for each subsequent year, differs from that in any of the present plans as also does the 100% vesting at age 40 with 10 years' service as proposed in Plan A. Presumably, service with any of the present group of Companies could count as service for vesting purposes under the proposed plan. Insofar as vesting right has developed under an existing plan it should be continued in the future, certainly with respect to the amounts of benefit accrued under the old plans, and perhaps, for administrative reasons, even with respect to benefits accrued subsequent to the effective date of the new plan for present participants. Of course, if the new plan has more liberal vesting, this should be made applicable to all participants and to all benefits whether accrued before or after the effective date of the amended plan.

Old Age Pension - There is a reduction of pension in the CanCar Plans of any amount by which the Old Age Pension exceeds $40.00 a month. There is no mention of integration or reduction of the Old Age Pension in the Avro or C.S.I. Plans. If the Old Age Pension is disregarded in the proposed plan, then there is no problem since this constitutes a liberalization in the case of the CanCar plans.

Optional Retirement Benefits - In the Avro and C.S.I. plans there is provision for a ten-year guarantee of the pension. In all the plans there is an optional provision for a reduced pension to go to a surviving annuitant.

There should be no objection to an employee applying his own contributions to s surviving annuitant form, or making such other arrangements as may assure the full return of all of his contributions. However, the ten-year guarantee or any other guaranteed form is not recommended as the normal form for pensions accruing after the effective date of the new plan, at least under the noncontributory plan. If an employee feels he has a right to some death benefit, it should be limited to the benefits accrued prior to the adoption of the proposed plan, unless, of course, he accepts an optional form of annuity containing guarantees but equal in value, i.e., actuarially equivalent (reduced), to the normal form (no death benefit) of annuity.

The question of giving the right to appoint a contingent annuitant is one of policy. It is widely found in modern pension plans (subject to certain "underwriting" requirements), and if adopted, it should create no problem or increased costs.

Death Benefit Prior to Retirement - A death benefit prior to retirement equal to the refund of employee contributions under the Avro and CanCar Plans is the required minimum. Under C.S.I. there is a return of the greater of the contributions or a fixed amount. Cancar and C.S.I. also allow interest, Avro does not. We recommend a death benefit of the return of the employee's contributions (with or without interest, although we prefer with interest) under the new plan. This benefit is easily handled.

Summary - The problems involved can briefly be summarized as follows:

1. Benefits accrued under the present plans up to the effective date of the new plan should be provided in addition to the benefits which will accrue under the new plan after its effective date, although both will be subject to the applicable vesting conditions.

2. If there is no past service credited under the new plan, then benefits for those not covered under a present plan will be only as provided in the new plan.

3. It is most desirable that all future benefits be provided under the new plan, thus promoting uniformity throughout. Existing plans should be amended wherever necessary and feasible to attain such uniformity.

4. The question of freezing the present insurance contracts or trusts or of applying the cash surrender value is one to be decided after the financing medium for the revised plan has been determined.

5. In the case of hourly employees (who are only covered under CanCar Plan), consideration might be given, because of the relatively few years of credited service, to permitting a participant to "cash out" all of his rights under the present plan. In that case he should receive his contributions back (perhaps with interest because interest is allowed on death claims); we would favor giving him (the larger) cash value of his accrued benefits. The alternative is to hold the accrued benefits as a deferred pension. If it may be assumed that most hourly participants would elect a cash settlement if it were made available to them, greater uniformity would result in that all hourly employees would be covered for future service benefits only.

A summary of the terms of the present plans on the basis of which these comments have been made will be found in Exhibit 6(a).

SECTION VI - Financing Media

We have been asked to discuss the principal features of the media which are in general use for the purpose of financing pension plans, and make a recommendation as to which is, in our opinion, the preferable one to select for the pension arrangements here under consideration. By "financing medium" we have reference to the type of agency utilized to invest the money contributed under the plan, to disburse pension payments and to assist, in such measure as may seem desirable, with the administration of the Plan.

There are available two such agencies, the insurance company and the chartered trust company.

The insurance company offers two general types of financing arrangement that might be considered. The more widely found of the two is the traditional unit purchase - deferred annuity type of group annuity contract where an individual unit of benefit is purchased (and usually paid for with a single premium - although an occasional level premium funding approach is found) in respect of each year's participation in the Plan. The other insurance company arrangement is the newer, more versatile, deposit administration group annuity contract whereunder the premiums are accumulated prior to retirement, without being allocated to the participants, and then at retirement the total single premium for the employee's benefit is set aside from the fund and allocated more or less specifically to provide the benefits of the retiring employee.

The trust fund approach, utilizing the services of a chartered trust company does not require such individual allocations at any time, and can be adapted to practically any type of pension plan arrangement.

In some situations both an insurance company contract and a trust fund are used concurrently for financing a pension plan, such "split-funding" being usually found only when the plan is a large one.

For many years the insurance companies have had practically a monopoly on pension business, although certain of the larger financial institutions did operate their own pension funds as separate trusts. In the last few years, the competition developed by chartered trust companies has become very active and these companies are now offering pension fund financing services similar to those provided by insurance companies. There are differences of opinion, sometimes quite sharp, on the question of insurance company versus trust fund financing of a pension plan. Both sides point to features which they believe their product alone can offer, and there is no doubt but that some of the advocates of either approach are somewhat biased in their evaluation of the method with which they are most familiar.

The main points in deciding which financing medium to use for a pension plan centers around guarantees, expenses, investment results, and what might be termed accommodation or flexibility. In what follows, the comparison is made between a trust fund type of financing and the typical group annuity contract. While the trust fund medium may be accommodated to almost any plan or type of benefit or provision, the typical group annuity contract is somewhat limited in its ability to accommodate itself, and, as a result, the insurance companies have, as a competitive measure, introduced various forms of somewhat more flexible contracts usually identified as "Deposit Administration" contracts which were mentioned above.

The insurance companies stress the fact that an annuity purchased from an insurance company is guaranteed by the company. By this, they mean that the entire assets of the insurance company stand behind all of the obligations which it assumes. However, these guarantees involve corresponding costs which are so determined that the insurance company in actuality assumes very little risk, either investment or actuarial. The insurance company avoids this risk through the use of conservative actuarial factors, producing relatively high contribution requirements (premiums) and through the accumulation of contingency funds out of these contributions which become available if the premiums originally charged should prove inadequate in the light of later experience. Furthermore, the insurance companies guarantee that during a limited period, such as the first five years, the premium rates charged will be those initially offered. Following this guarantee period, however, the insurance companies may adjust the premium rates and if a loss has been suffered on the earlier rates, the insurance company may, of course, design its subsequent premium rates so as to permit it to recoup these losses. The premium rate guarantees, are, therefore, of little real consequence.

The large trust fund plan, particularly if the assets implementing the plan are substantial, can (and certainly it should be an objective of the managers of the fund to do so) provide almost as good "guarantees" through the use of sound investments and the adoption of conservative actuarial factors in determining the contributions to be made under the plan.

The two media of pension plan administration - trust fund and insurance company - may have differing operational expenses. Certain expenses will be about the same under both forms, such as actuarial costs or fees, investment expense, legal fees (whether borne by outside attorneys in the case of a trust fund or included directly in the premium levels if an insurance contract). Some expenses, however, will differ; for example, there may be tax differentials in the two forms and agent's commissions are usually charged in the case of an insured contract but not under a trust (although such commissions are usually not particularly significant). There is apt to be less duplication of records under a trust fund plan, with some opportunity for modest savings in administrative expense.

The costs of operation are not possible of close comparison because in the case of the insurance company these costs are included as an integral part of the annual premium charge. In the case of a trust fund, it is possible to set out in more detail the specific expenses involved and one trust fund quotes the following fees which, we understand, are reasonably representative for other Canadian trust companies:

A. A fee which is

1/4 of 1% on the first	$2,000,000 of assets
1/8 of 1% on the next	3,000,000 of assets
1/20 of 1% on all over	5,000,000 of assets

This fee is based on book value of the trust fund at the end of the fiscal year. If, as often happens, a deposit is made just at the end of the year, it is usual practice to exclude it for fee purposes. The minimum annual fee is $150.00.

B. A fee of 15 cents for preparing cheques is in effect but costs now being studied indicate this should be increased.

C. No other charges normally apply except that when special reports other than monthly cash statements and the annual accounting are required - a fee based on costs is charged.

The investment earnings of a pension fund has a considerable effect on costs and it is in this area that the trusteed plan offers greater opportunities for higher earnings and lower costs. It is, of course, desirable to obtain the maximum investment yield consistent with safety. The limitation on the investment powers of a trustee, formerly restricted to those applicable to insurance companies, has now been removed. As a result, trustees are subject only to the "prudent man" rule, whereas the statutory limitations still apply to the investments of insurance companies. The chief difference lies in the power to invest in equities, limited in the case of insurance companies to 15% of total holdings, but subject in the case of trust funds to the "prudent man" rule. The use of a trust offers a better opportunity to protect a fund against the adverse effects of inflation and also to permit it to participate to a larger degree in capital gains, an important factor in an expanding economy such as Canada's.

There is no reason to assume that trustees or trust companies are not as sound investors as insurance companies. Generally speaking, with the same components in the portfolio, the earnings of each should be approximately the same and with the wider selection of types of investment possible in a trust fund, with a somewhat increased proportion of equities, the earnings of the trust might well, of course, be better than those of the insurance company. One difference in the two media lies in the fact that under an insurance company contract the full effect of increased earnings (i.e., earnings in excess of those assumed for the premium determination,) are not always immediately passed on to the credit of the plan. In a trust fund, such excess earnings are immediately available each year to apply against current contribution requirements.

With an insurance company all funds are pooled. Being pooled, a loss in one security is spread widely and unless of very serious proportions, it is not a significant burden against any one contract. To a large measure this same advantage of size and spread in investments is now available in trusteed funds through the use of common trusts where the assets of numerous pension funds are commingled and dealt with as a whole with each participating trust being entitled to a proportionate part of the earnings and of the capital gains and losses of the whole pooled fund. Of course the larger the trust fund which implements a pension plan, the more diversification in investments will develop anyway even where there is no pooling.

An employer has no choice in determining the investments in which funds will be placed in the case of an insurance company or pooled fund. If, however, the fund is held separately he may direct or hold veto powers over the type of investments utilized. This may be of some advantage although many employers prefer to have the trustee assume all investment responsibilities.

In a pension plan flexibility may be very important and here the advantage lies, in our opinion, with the trusteed type of plan even though the insurance companies have on certain cases shown considerable ingenuity in devising or amending group annuity plans, particularly of the deposit administration type, to incorporate flexibility into such an arrangement. We should stress that by flexibility we do not mean arbitrariness in acting in other than a sound and responsible manner.

The element of flexibility can perhaps be explained with a few illustrations:

(a) Under a flexible arrangement, the amount of contributions can be geared somewhat to the special circumstances existing in a particular year, i.e., either more or less than the calculated contribution requirement may be contributed depending on the financial circumstances of the company. Any increase or decrease would be carried over as a credit or debit to future years.

(b) It is easy to transfer a pension fund from one trust to another or from a trust to an insurance company, but to change from an insured plan to a trusteed fund is often complicated and expensive and may involve the vesting of the previously purchased annuities in the employees or impose other requirements which are not always in the employer's interests.

(c) A trust may be readily adapted to special situations, e.g., if a plan includes a substantial proportion of older employees near retirement when it is installed, the cost of the benefits for their older employees may be spread-funded beyond actual retirement. In the case of the insured plan it is normally required that each benefit be fully funded at retirement.

(d) A trust fund may include a wide range of provisions. For example, total and permanent disability benefits may be included and advance funding of such a benefit may be provided. Special benefits may be readily included for special circumstances, as may supplementary death benefits before or after retirement, or benefits to widows, etc.

(e) The language and phrasing of the plan may be greatly simplified if trusteed since the trust, standing on its own feet, does not need to be hedged about with various restrictions necessary in the insurance contract in order to preserve equity among various insured pension funds.

The current trend is quite definitely towards the trust fund type of contract; for example, in the United States in testimony given before Congress fairly recently, the president of a large insurance company gave the names of many companies which had recently changed from group annuity to trust fund pension plans in whole or in part. We are not aware of any plans which have been transferred in the opposite direction (i.e., from trust fund to insured). At the same time, we recognize that in some measure the popularity of the trust is traceable to the more favorable rates of investment return which have been possible and this advantage, of course, may not obtain permanently.

Sometimes, because of the reluctance of some employers to accept the potential investment risks which they feel may be present in a trust fund plan (although they still desire in some measure to avail themselves of the potentially higher investment returns including capital gains of a trust) and because, at the same time, they do not wish to be entirely restricted to the inflexibility of an insurance contract, they select a form of split-funding whereunder both a trust fund and an insurance company contract are utilized. One way of accomplishing this is by using the trust fund essentially during the accumulative period - that is, during the employees' working years - and at retirement (or over a period of years prior thereto) turn the accumulated funds over to an insurance company for ultimate disbursing to the retired employees. The funds, of course, may be allocated between the two financing media in advance of retirement on some basis which keeps the relationship between the two funds in an approximately equal status or according to whatever distribution might be preferred. We feel that the split-funding approach has considerable merit in a large pension plan and have recommended it in several instances.

While the relative merits of the trust fund versus the insurance company is a matter on which there presumably always will be a difference of opinion, our current preference for the trust fund medium is not intended to imply that we do not have a full and high regard for the use of insurance contracts in funding pension plans. We believe that such contracts can and always will play a useful role in this field. Our preference is influenced by the fact that it is possible to move in or out of the trusteed field with a minimum of trouble and expense, and that it is usually desirable in developing a pension plan to proceed slowly and be free to confirm or alter your choice or move to a split-funding approach after some experience has been gained in the operation of the plan.

SECTION VII. Illustrative Benefits in Other Pension Plans

For ready reference, Exhibits 5(a), 5(b), 6(a) and 6(b) in the Appendix attached furnished brief outlines of the principal provisions of representative pension plans now in effect (or proposed) and of illustrative benefits payable under these plans to representative pensioners.

Some of the companies selected are Canadian while others are domiciled in the United States. A selection of noncontributory plans has been made and the supplementary plans (contributory) associated with these basic noncontributory plans have also been reviewed.

In our analysis of the pension plans of many large companies, we find that the most widely found benefit for hourly employees under negotiated plans is currently \$2.25 per month per year of credited service, with "service" being defined to include all service, past and future. A few plans use \$2.50 and occasionally a \$2.75 rate of benefit accrual is found. In those instances where a lower rate of benefit accrual, such as \$1.75, is found, it is to be expected that at the next round of negotiations this level will be increased.

While we appreciate that union demands are being formulated for considerably higher levels of benefit accrual than the \$2.25 rate, we feel that initially it is desirable to think in terms of the \$2.25 rate, even though the forthcoming and future negotiations may be in the direction of increasing the rate of benefit accrual.

In those cases where the percentage of benefit approach (Plan B type) is used (somewhat less frequently found than the \$2.25 or flat dollar type), the percentage benefit accrual rate is higher than the 3/4% noncontributory benefit proposed in this report. However, the favorable tax treatment afforded employee contributions in Canada strongly supports the granting of supplementary benefits financed on a joint employee and employer basis. The 1% contributory plan proposed as a supplement to the 3/4% noncontributory benefit level, together with such further improvement in benefits as would arise from additional voluntary employee-pay-all increments, should produce adequate pension benefits to all employees, hourly and salaried.

This report has been prepared with a view to furnishing general information relative to the design of a basic pension plan covering all employees of A.V. Roe Canada Limited, and providing estimates of the initial annual cost of such basic plan. In addition, the matter of designing a Supplementary Pension Plan on a contributory basis has been discussed, as also has the question of integrating into the proposed program the existing pension plans of the subsidiary companies, and the selection of a suitable financing medium.

We will be pleased to expand such sections of this report as you might find helpful and to conduct such further studies as you may request.

Respectfully submitted,

THE WYATT COMPANY

James A. Hamilton

James A. Hamilton, F.S.A.

Henry G. Neebe

Henry G. Neebe, F.S.A.

APPENDIX

A. V. ROE CANADA LIMITED

Actuarial Basis of Cost Estimates

1. BASIC DATA

A. Valuation Units

(a) Avro Aircraft Limited and Orenda Engines Limited (combined) - Hourly Paid Employees - For the current valuations we used the same basic data that was furnished us in connection with our February 15, 1957 report, with two adjustments: (1) In the instant report, we did not provide for a minimum benefit whereas in the earlier report we assumed a minimum of $300 a year; and (2) We recomputed costs on the basis of attained age as of 7-1-57 so as to be consistent with all other cost estimates shown in this report. (In the previous report we used the attained age in 1956).

(b) Avro Aircraft Limited - Weekly Salaried Employees - The data consisted of a listing by employee number, giving both year of birth and year of hire. The daily rate of pay was shown, which was converted to a yearly rate by multiplying by 250.

(c) Avro Aircraft Limited - Monthly Paid Staff - The basic data consisted of a listing by employee number giving the date of birth, the date of hire, and the salary code as used in the retirement plan. This code gave the annual pay directly and therefore no adjustment was necessary.

(d) Orenda Engines Limited - Weekly Salaried Employees - The data consisted of a listing by employee number by department, giving year of birth, year of hire, and daily rate of pay. The daily rate of pay was converted to an annual rate by multiplying by 260.

(e) Orenda Engines Limited - Semi-Monthly Paid Employees - The data was submitted in exactly the same form as was the data for the weekly paid employees, except that the pay code was shown which gave the annual rate of pay directly.

(f) Canadian Car & Foundry Company Limited - Hourly Paid Employees Not in Present Plan - The data consisted of a listing by name and job classification, giving year of birth and date of seniority, which we assumed to be the date of hire for our purposes. We assumed an average annual pay for all employees of $4,000.

(g) Canadian Car & Foundry Company Limited - Weekly Paid Employees Not in Present Plan - The data was submitted in exactly the same form as that for the hourly paid employees except that the weekly pay was given, which was converted to an annual rate by multiplying by 52.

(h) Canadian Car & Foundry Company Limited - Hourly and Salaried Employees in Present Plan - The data submitted for this group of employees consisted of a listing showing present coverage by year of birth. It did not show earnings but we, on the basis of accumulated contributions shown on the listing, assumed $3,000 annual for all employees except for salaried group where $3,300 was assumed. Because this listing did not show year of hire we could not make any valuations for the plans now under consideration which include past service.

B. General

Exhibit 1 of this Appendix shows an age and service distribution, separately by sex, for each of the valuation units. For the reasons given above, we are not able to show the service distribution for the Canadian Car & Foundry employees who are participants in the present plan, and consequently for these employees we are only showing an age distribution. The average attained age is also shown on this Exhibit 1.

2. THE PLANS BEING VALUED

Cost estimates were determined separately for each of the valuation units, and separately for males and females, although in the cost summaries males and females were combined. Separate cost figures were also determined on an interest rate assumption of (a) 3-1/2% and (b) 4%. These cost estimates as well as other pertinent data are shown in Exhibit 2 of the Appendix for the 3-1/2% interest valuations and in Exhibit 3 of this Appendix for the 4% interest valuations. The constant dollar plans are designated A-1 (Future Service Only) and A-2 (Future Service and Past Service); the percentage of pay plans are designated B-1 (Future Service Only) and B-2 (Future Service and Past Service).

Very briefly, the main specifications of the plans being valued are:

(1) An effective average retirement age of 65 for Salaried employees and 68 for Hourly-paid employees.

(2) It was assumed that the accrued benefits would be payable at disability without reduction and that eligibility for disability benefits would be liberal.

(3) We assumed a very modest set of withdrawal factors, which means that the plans being valued permit fairly liberal (early) vesting of accrued benefits upon termination of employment.

(4) It should be pointed out that the retirement ages 65 and 68, which we used, are the effective cost ages at retirement, and take into account benefits which become payable at early retirement and late retirement, as well as normal retirement.

3. ACTUARIAL FACTORS ASSUMED IN VALUING THE PLANS

Exhibit 4 of this Appendix is a brief outline of the principal actuarial factors used in valuing the plans together with illustrative values for quinquennial attained ages. Our previous report in Part C "Cost Estimates" discussed these factors in some detail.

Exhibit 4

A. V. ROE CANADA LIMITED

Hourly Paid and Salaried Employees

Brief Outline of Principal Actuarial Factors

1. Mortality Rates:	Basic Group Annuity Table for 1951 projected 14 years to 1965 for males; 5-year age modification for females.
2. Interest Rate:	3-1/2% and 4%.
3. Withdrawal Rates:	The hourly male rates are based on an analysis of withdrawal rates experienced by another Company. Hourly female rates were taken as 50% more than the hourly male rates. The rates for salaried employees were taken as 50% of the hourly rates for males and 66-2/3% for females.
4. Disability:	Three times Hunter's Disability Rates for males and four times for females, combined with Hunter's Ultimate Rate of Mortality among Disabled Lives.
5. Normal Retirement Dates:	Age 68 for the Hourly Plans and age 65 for the Salaried Plans.
6. Funding Methods:	Aggregate cost method. Under this method of funding the present value of all future benefits for present and retired (but no retired lives in present valuations) employees, reduced by any reserve funds on hand (none in present valuations) is divided by the present value of all future pay. The resulting percentage accrual rate when applied to the current pay gives the current year's contribution. This gives a contribution requirement which is stated in terms of a constant per cent of pay.

7. Illustrative rates of death, disability and withdrawal are shown on the following tabulation.

Exhibit 4 (Continued)

Table of Illustrative Annual Decremental Rates Per 1,000
By Attained Age

A. Rates of Death and Disability

Death Rate Among Active & Retired Lives		Attained Age	Death Rate Among Disabled Lives	Rate of Disablement	
Males	Females		Males & Females	Males	Females
.706	.574	25	151	1.584	2.112
.923	.706	30	106	1.683	2.244
1.280	.923	35	89	1.926	2.568
1.863	1.280	40	85	2.496	3.328
3.336	1.863	45	87	3.453	4.604
6.032	3.336	50	91	5.088	6.784
9.724	6.032	55	101	8.256	11.008
14.492	9.724	60	111	16.206	21.608
22.750	14.492	65	115	-	-
36.619	22.750	70	115	-	-
60.259	36.619	75	118	-	-
100.853	60.259	80	144	-	-
155.717	100.853	85	236	-	-

B. Rates of Withdrawal

Hourly Employees		Attained Age	Salaried Employees	
Males	Females		Males	Females
126	189	25	63	126
80	120	30	40	80
49	74	35	25	49
32	48	40	16	32
15	22	45	8	15
2	3	50	1	2

A. V. ROE CANADA LIMITED

APPENDIX
EXHIBIT 1

Distribution of Employees By Age, Service and Sex

Number of Employees (Figures in parentheses are number of females included in total figure)

Avro Aircraft Limited - Weekly Salaried

Age Nearest Birthday 7/1/57	Number of Years of Service by 7/1/57: 3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under	460 (183)	113 (68)	-		573 (251)
25 - 29	405 (64)	219 (62)	5 (2)		629 (128)
30 - 34	253 (51)	233 (34)	26 (4)		512 (89)
35 - 39	176 (49)	206 (37)	21 (3)		403 (89)
40 - 44	106 (34)	169 (38)	29 (2)		304 (74)
45 - 49	58 (12)	134 (26)	27 (4)		219 (42)
50 - 54	38 (8)	85 (18)	18 (1)		141 (27)
55 - 59	7 (1)	51 (17)	11		69 (18)
60 - 64	3	19	8		30
65 & Over	1	10	8		19
TOTAL	1507 (402)	1239 (300)	153 (16)		2899 (718)
Average Attained Age					34 (32)

Avro Aircraft Limited - Monthly Salaried

Age Nearest Birthday 7/1/57	Number of Years of Service by 7/1/57: 3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under		1			1 (-)
25 - 29	18	11 (1)	2		31 (1)
30 - 34	32 (1)	96 (1)	19		147 (2)
35 - 39	26	90 (1)	42		158 (1)
40 - 44	8	71	53		132 (-)
45 - 49	3	33	35		71 (-)
50 - 54		14	26		40 (-)
55 - 59		14 (1)	12		26 (1)
60 - 64		2	11		13 (-)
65 & Over		3			3 (-)
TOTAL	87 (1)	335 (4)	200		622 (5)
Average Attained Age					40 (37)

Avro Aircraft and Orenda Engines Limited - Hourly

Age Nearest Birthday 7/1/57	Number of Years of Service by 7/1/57: 3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under	147	209 (1)			356 (1)
25 - 29	307 (1)	683 (3)	1		991 (4)
30 - 34	334 (1)	1074 (11)	20		1428 (12)
35 - 39	283	1056 (20)	36 (1)		1375 (21)
40 - 44	222 (2)	895 (12)	42 (1)		1159 (15)
45 - 49	145 (2)	674 (6)	49		868 (8)
50 - 54	117 (3)	484 (6)	42 (1)		643 (10)
55 - 59	75	307 (2)	35		417 (2)
60 - 64	34	190	32		256
65 & Over	17	89	47		153
TOTAL	1681 (9)	5661 (61)	304 (3)		7646 (73)
Average Attained Age					40 (40)

Orenda Engines Limited - Weekly Salaried

Age Nearest Birthday 7/1/57	3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under	223 (128)	61 (42)			284 (170)
25 - 29	126 (52)	112 (28)	1		239 (80)
30 - 34	81 (30)	130 (18)	4		215 (48)
35 - 39	63 (27)	146 (21)	5		214 (48)
40 - 44	45 (22)	106 (17)	7	1	159 (39)
45 - 49	23 (7)	65 (10)	6 (1)	2	96 (18)
50 - 54	15 (2)	47 (6)	7		69 (8)
55 - 59	9	32 (4)	3 (1)	1	45 (5)
60 - 64	2	11 (2)	4		17 (2)
65 & Over	1	5	3	1	10
TOTAL	588 (268)	715 (148)	40 (2)	5	1348 (418)
Average Attained Age					35 (30)

Orenda Engines Limited - Semi-Monthly Salaried

Age Nearest Birthday 7/1/57	3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under		1			1
25 - 29	2	12			14
30 - 34	17	66	25 (1)		108 (1)
35 - 39	15	58	26		99
40 - 44	7	57	31		95
45 - 49	1	27	14		42
50 - 54	2	13	15		30
55 - 59	-	9	10		19
60 - 64		1	3		4
65 & Over			2		2
TOTAL	44	244	126 (1)		414 (1)
Average Attained Age					40 (32)

Canadian Car & Foundry, Limited - Salaried Participants in Present Plan -

NOT AVAILABLE

Age Nearest Birthday 7/1/57	3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under					
25 - 29					
30 - 34					202 (10)
35 - 39					376 (7)
40 - 44					490 (18)
45 - 49					449 (16)
50 - 54					150 (13)
55 - 59					104 (12)
60 - 64					77 (1)
65 & Over					17
TOTAL					1865 (77)
Average Attained Age					44 (46)

Canadian Car & Foundry Company, Limited Salaried Non-Participants in Present Plan

Age Nearest Birthday 7/1/57	3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under	32 (22)	20 (16)			52 (38)
25 - 29	11 (8)	25 (7)			36 (15)
30 - 34	11 (4)	27 (10)	1 (1)	4	43 (15)
35 - 39	5 (2)	24 (12)	4 (1)	17 (1)	50 (16)
40 - 44	4 (3)	18 (6)	4 (2)	35 (3)	61 (14)
45 - 59	2 (1)	15 (2)	2 (1)	15 (1)	34 (5)
50 - 54		5 (1)	-	6	11 (1)
55 - 59	1	3 (1)		9 (1)	13 (2)
60 - 64		1	1	5	7 (-)
65 & Over				1	1 (-)
TOTAL	66 (40)	138 (55)	12 (5)	92 (6)	308 (106)
Average Attained Age					37 (31)

Canadian Car & Foundry Company, Limited Hourly Participants in Present Plan

NOT AVAILABLE

Age Nearest Birthday 7/1/57	3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under					
25 - 29					
30 - 34					
35 - 39					
40 - 44					
45 - 59					26
50 - 54					386
55 - 59					291 (1)
60 - 64					244 (1)
65 & Over					51
TOTAL					998 (2)
Average Attained Age					57 (60)

Canadian Car & Foundry Company, Limited Hourly Non-Participants in Present Plan

Age Nearest Birthday 7/1/57	3 Years or Less	4 to 9 Years	10 to 15 Years	16 or More Years	Total
24 & Under	10	25			35 (-)
25 - 29	18	84	1		103 (-)
30 - 34	17	104 (2)	7 (1)	18	146 (3)
35 - 39	13	105 (3)	10	48	176 (3)
40 - 44	13	118 (2)	12	85 (1)	228 (3)
45 - 59	7	99 (4)	14	44	164 (4)
50 - 54	3	74 (1)	15	32	124 (1)
55 - 59	-	52 (2)	9	18	79 (2)
60 - 64		14	7	11	32
65 & Over					
TOTAL	81	675 (14)	75 (1)	256 (1)	1087 (16)
Average Attained Age					41 (43)

APPENDIX
EXHIBIT 2

A. V. ROE CANADA LIMITED

First Year Contribution Requirements for Illustrative Pension Plans
3-1/2% Interest Basis
Contribution Requirements for Unit of Benefits (1% of Pay or $1 per Month)

	Avro Aircraft Ltd.		Avro Aircraft Ltd. and Orenda Engines Ltd.	Orenda Engines Ltd.		Canadian Car & Foundry Company, Ltd.			
						Salaried		Hourly	
	Weekly Salaried (1)	Monthly Salaried (2)	Hourly (3)	Weekly Salaried (4)	Monthly Salaried (5)	Participants In Present Plan (6)	Non-Participants In Present Plan (7)	Participants In Present Plan (8)	Non-Participants In Present Plan (9)
I. Census Data									
1. Number of Employees (% of Females in Parentheses)	2,899(25%)	622(1%)	7,646(1%)	1,348(31%)	414(*)	1,865(4%)	308(34%)	998(*)	1,087(1%)
2. Annual Earnings	$10,894,000	$4,579,300	$30,584,000	$5,015,400	$2,910,700	$6,131,400	$1,184,500	$2,994,000	$4,348,000
3. Average Annual Earnings	3,758	7,362	4,000 1/	3,721	7,031	3,288 2/	3,846	3,000 3/	4,000 1/
4. Average Attained Age 7/1/57	34	40	40	35	40	44	37	57	41
II. A-1 Type Benefit Equal to $1.00 a Month per Year of Service - Future Service Only									
1. Annual Benefits Being Valued	$ 1,089,000	$ 187,500	$ 2,593,700	$ 496,700	$ 124,500	$ 471,700	$ 104,800	$ 138,000	$ 347,800
2. Average Annual Benefit	376	301	339	369	301	253	340	138	320
3. Accrual Rate as % of Pay	1.417%	0.837%	1.211%	1.452%	0.874%	2.064%	1.527%	2.551%	1.284%
4. First Year Contribution Requirement (I-2xII-3)	$ 154,400	$ 38,300	$ 370,400	$ 72,800	$ 25,400	$ 126,600	$ 18,100	$ 76,400	$ 55,800
5. % of II-4 Attributable to Disability Benefit	15.3%	14.1%	14.2%	15.2%	14.1%	13.0%	14.8%	6.6%	13.5%
6. Annual Cost per Employee	$ 53	$ 62	$ 48	$ 54	$ 61	$ 68	$ 59	$ 77	$ 51
III. A-2 Type Benefit Equal to $1.00 a Month per Year of Service - Past and Future Service									
1. Annual Benefits Being Valued	$ 1,222,800	$ 242,400	$ 3,056,000	$ 564,100	$ 162,300		$ 135,800		$ 458,900
2. Average Annual Benefit	422	390	400	418	392	Not Available	441	Not Available	422
3. Accrual Rate as % of Pay	1.695%	1.148%	1.531%	1.761%	1.195%		2.289%		1.856%
4. First Year Contribution Requirement (I-2xIII-3)	$ 184,600	$ 52,600	$ 468,400	$ 88,300	$ 34,800		$ 27,100		$ 80,700
5. % of III-4 Attributable to Disability Benefit	14.8%	13.5%	13.8%	14.7%	13.6%		13.7%		13.3%
6. Annual Cost per Employee	$ 64	$ 85	$ 61	$ 66	$ 84		$ 88		$ 74
IV. B-1 Type Benefit Equal to 1% of Career Average Pay for Each Year of Service - Future Service Only									
1. Annual Benefits Being Valued	$ 3,320,200	$1,152,300	$ 8,645,700	$1,474,800	$ 728,400	$1,292,700	$ 310,600	$ 345,000	$1,159,200
2. Average Annual Benefit	1,145	1,853	1,131	1,094	1,760	693	1,008	346	1,066
3. Accrual Rate as % of Pay	4.525%	5.146%	4.037%	4.648%	5.140%	5.650%	5.116%	6.378%	4.281%
4. First Year Contribution Requirement (I-2xIV-3)	$ 493,000	$ 235,600	$ 1,234,600	$ 233,100	$ 149,600	$ 346,400	$ 60,600	$ 191,000	$ 186,200
5. % of IV-4 Attributable to Disability Benefit	15.1%	14.1%	14.2%	14.9%	14.1%	13.0%	14.2%	6.6%	13.5%
V. B-2 Type Benefit Equal to 1% of Career Average Pay for Each Year of Service - Past and Future Service									
1. Annual Benefits Being Valued	$ 3,773,700	$1,491,700	$10,186,600	$1,703,500	$ 953,300		$ 429,100		$1,529,600
2. Average Annual Benefit	1,302	2,398	1,332	1,264	2,303	Not Available	1,393	Not Available	1,407
3. Accrual Rate as % of Pay	5.472%	7.052%	5.105%	5.729%	7.043%		8.130%		6.185%
4. First Year Contribution Requirement (I-2xV-3)	$ 596,100	$ 322,900	$ 1,561,300	$ 287,300	$ 205,000		$ 96,300		$ 268,900
5. % of V-4 Attributable to Disability Benefit	14.6%	13.6%	13.8%	14.4%	13.7%		13.1%		13.3%

1/ Flat $4,000 Assumed for all employees.
2/ Flat $3,300 Assumed for Males, $3,000 for Females.
3/ Flat $3,000 Assumed for all employees.

* Less than 0.5%

APPENDIX
EXHIBIT 3

A. V. ROE CANADA LIMITED

First Year Contribution Requirements for Illustrative Pension Plans
4% Interest Basis
Contribution Requirements for Unit of Benefits (1% of Pay or $1 per Month)

	Avro Aircraft Ltd.		Avro Aircraft Ltd. and Orenda Engines Ltd.	Orenda Engines Ltd.		Canadian Car & Foundry Company, Ltd.			
						Salaried		Hourly	
	Weekly Salaried	Monthly Salaried	Hourly	Weekly Salaried	Monthly Salaried	Participants In Present Plan	Non-Participants In Present Plan	Participants In Present Plan	Non-Participants In Present Plan
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I. Census Data									
1. Number of Employees (% of Females in Parentheses)	2,899(25%)	622(1%)	7,646(1%)	1,348(31%)	414(*)	1,865(4%)	308(34%)	998(*)	1,087(1%)
2. Annual Earnings	$10,894,000	$4,579,300	$30,584,000	$5,015,400	$2,910,700	$6,131,400	$1,184,500	$2,994,000	$4,348,000
3. Average Annual Earnings	3,758	7,362	4,000 1/	3,721	7,031	3,288 2/	3,846	3,000 3/	4,000 1/
4. Average Attained Age 7-1-57	34	40	40	35	40	44	37	57	41
II. A-1 Type Benefit Equal to $1.00 a Month per Year of Service - Future Service Only									
1. Annual Benefits Being Valued	$ 1,089,000	$ 187,500	$ 2,593,700	$ 496,700	$ 124,500	$ 471,700	$ 104,800	$ 138,000	$ 347,800
2. Average Annual Benefit	376	301	339	369	301	253	340	138	320
3. Accrual Rate as % of Pay	1.242%	0.745%	1.092%	1.275%	0.777%	1.852%	1.348%	2.388%	1.172%
4. First Year Contribution Requirement (I-2xII-3)	$ 135,300	$ 34,100	$ 334,000	$ 63,900	$ 22,600	$ 113,600	$ 16,000	$ 71,500	$ 51,000
5. % of II-4 Attributable to Disability Benefit	14.8%	13.5%	14.9%	14.7%	13.6%	12.4%	14.2%	6.8%	14.1%
6. Annual Cost per Employee	$ 47	$ 55	$ 44	$ 47	$ 55	$ 61	$ 52	$ 72	$ 47
III. A-2 Type Benefit Equal to $1.00 a Month per Year of Service - Past and Future Service									
1. Annual Benefits Being Valued	$ 1,222,800	$ 242,400	$ 3,056,000	$ 564,100	$ 162,300		$ 135,800		$ 458,900
2. Average Annual Benefit	422	390	400	418	392	Not Available	441	Not Available	422
3. Accrual Rate as % of Pay	1.494%	1.028%	1.390%	1.556%	1.068%		2.044%		1.704%
4. First Year Contribution Requirement (I-2xIII-3)	$ 162,800	$ 47,100	$ 425,100	$ 78,000	$ 31,100		$ 24,200		$ 74,100
5. % of III-4 Attributable to Disability Benefit	14.3%	12.9%	14.4%	14.1%	13.0%		13.0%		13.9%
6. Annual Cost per Employee	$ 56	$ 76	$ 56	$ 58	$ 75		$ 79		$ 68
IV. B-1 Type Benefit Equal to 1% of Career Average Pay for Each Year of Service - Future Service Only									
1. Annual Benefits Being Valued	$ 3,320,200	$1,152,300	$ 8,645,700	$1,474,800	$ 728,400	$1,292,700	$ 310,600	$ 345,000	$1,159,200
2. Average Annual Benefit	1,145	1,853	1,131	1,094	1,760	693	1,008	346	1,066
3. Accrual Rate as % of Pay	3.975%	4.575%	3.641%	4.093%	4.571%	5.070%	4.543%	5.971%	3.907%
4. First Year Contribution Requirement (I-2xIV-3)	$ 433,000	$ 209,500	$ 1,113,400	$ 205,300	$ 133,100	$ 310,900	$ 53,800	$ 178,800	$ 170,000
5. % of IV-4 Attributable to Disability Benefit	14.6%	13.6%	14.9%	14.4%	13.6%	12.4%	13.6%	6.8%	14.1%
V. B-2 Type Benefit Equal to 1% of Career Average Pay for Each Year of Service - Past and Future Service									
1. Annual Benefits Being Valued	$ 3,773,700	$1,491,700	$10,186,600	$1,703,500	$ 953,300		$ 429,100		$1,529,600
2. Average Annual Benefit	1,302	2,398	1,332	1,264	2,303	Not Available	1,393	Not Available	1,407
3. Accrual Rate as % of Pay	4.835%	6.307%	4.633%	5.077%	6.054%		7.303%		5.678%
4. First Year Contribution Requirement (I-2xV-3)	$ 526,700	$ 288,800	$ 1,417,000	$ 254,600	$ 176,200		$ 86,500		$ 246,900
5. % of V-4 Attributable to Disability Benefit	14.1%	12.9%	14.4%	13.8%	13.6%		12.4%		13.9%

1/ Flat $4,000 Assumed for all employees.
2/ Flat $3,300 Assumed for Males, $3,000 for Females.
3/ Flat $3,000 Assumed for all employees.

* Less than 0.5%

APPENDIX - EXHIBIT 5(a)

A. V. ROE CANADA LIMITED

Brief Outline of Non-Contributory Pension Plans

	I. NORMAL RETIREMENT a. Eligibility b. Benefit Accrual Per Yr. of Service c. Automatic Retirement Age	II. DISABILITY RETIREMENT a. Eligibility b. Benefit c. Inclusive of Federal Benefits	III. EARLY RETIREMENT a. Eligibility b. Reduction Per Month Under Age 65 c. Other	IV. MISCELLANEOUS a. Vesting b. Is there a contributory Plan?
I. Ford - Canada	a. Age 65 b. $2.25 plus, payable from N.R.A. to 70, $1.60 (max. 25 yrs.)	a. b. $3.25 to age 65, $2.25 thereafter.	a. Age 60 b.	a. Age 40 and 10 yrs. b.
II. Westinghouse - Canada	a. Age 70 b. $2.75	a. Age 60 b. $2.75	a. From Age 68 b.	a. No vesting b.
III. General Motors - Canada - - Hourly -	a. Age 65 and 10 years. b. $2.25 plus Supp. $.40 (25 yrs. maximum on Supp.) c. Age 69	a. 15 years b. Accrued Benefit plus $1.00 to age 70, Supp. $.40 thereafter. c.	a. Age 60 and 10 yrs. b. .6% Reduction (but not on Supp. $.40) c. If Company consent, no reduction.	a. Age 40 and 10 yrs.; only service after age 30. b. No contributory plan c.
IV. General Motors - Canada - - Salaried - (Final Excess = 10yrs. - $375)	a.) b.) Same as Hourly, plus .6% Final Excess Pay. c.	a.) b.) Same as Hourly, including .6% Final Excess Pay. c.	a.) b.) c.) Same as Hourly, including .6% Final Excess Pay.	a. Same as Hourly. b. Contributory Plan also - Salaried Employees earning $250 or more pay.
V. General Motors - U.S. - - Hourly -	a. Age 65 and 10 years. b. $2.25 c. Age 68 - benefits accrue.	a. 15 years. b. Accrued Benefits plus special $2.25 to age 65. c. Social Security - Dis. & W.C.	a. Age 60 and 10 years. b. .6% reduction. c. If Company consent, no reduction plus additional $2.25 to age 65.	a. Age 40 and 10 yrs.; only service after age 30. b. No contributory plan.
VI. General Motors - U.S. - - Salaried - (Final Excess = 10 yrs. - $375)	a.) Same as Hourly, plus b.) .6% Final Excess Pay. c.) Same as Hourly, except if $250 Pay, retirement fixed at age 65.	a.) b.) c.) Same as Hourly including .6% Final Excess Pay.	a.) b.) c.) Same as Hourly including .6% Final Excess Pay.	a. Same as Hourly. b. Contributory plan also - Salaried employees earning $250 or more pay.
VII. Union Carbide and Carbon Co. U. S. - Proposed Plan	a. Age 65 and 10 years. b. 1.1% Final Pay.	a. 15 years b. Accrued benefit; minimum $2.50 plus flat $50 until S.S. starts. c. Workmen's Comp.; Social Security	a. Age 60 and 30 years b. No reduction.	a. Age 40 and 10 yrs.; only service after age 30. b.

A. V. ROE CANADA LIMITED

Brief Outline of Non-Contributory Pension Plans

	I. NORMAL RETIREMENT a. Eligibility b. Benefit Accrual per Yr. of Service c. Automatic Retirement Age	II. DISABILITY RETIREMENT a. Eligibility b. Benefit c. Inclusive of Federal Benefits	III. EARLY RETIREMENT a. Eligibility b. Reduction Per Month Under age 65 c. Other	IV. MISCELLANEOUS a. Vesting b. Is there a contributory plan?
VIII. U.S. Steel - Hourly & Salaried (Final Pay = 10 yrs.)	a. Age 65 and 15 years. b. 1% Final Pay minus $85,; minimum $2.50 ($2.40 prior to 11/1/57); 30 yrs. max. on minimum benefit.	a. 15 years. b. Accrued benefit; minimum $90.00. c. Social Security.	a. Age 60 and 15 years. b. Actuarial Reduction.	a. Age 40 and 15 years. b. No contributory plan.
IX. Westinghouse Electric- U.S. - Hourly & Salaried	a. Age 65 b. $2.25 after 1-1-56 ($2.00 before). c.	a. 15 years & prior to age 60. b. $4.25 to age 60, then early retirement benefits commence. c. Social Security	a. Age 60 and 10 years. b. .6% reduction. c. Add'l to age 65 = Flat $45 plus $1.00 per yr. over 10 years.	a. Age 40 & 15 years. b. Contributory plan also. Salaried employees under age 55 who earn $400 & Over a month.
X. North American Aviation - Hourly -	a. Age 65 and 10 years. b. $1.75 (30 yrs. max.) c. Age 68 - benefits accrue.	a. Age 55 and 10 years. b. Flat $70 to age 65, accrued benefits thereafter. c.	a. Age 60 and 15 years. b. c.	a. b. No contributory plan.
IX. North American Aviation - Salaried - (Final Excess = 10 yrs.- $350)	a.) Same as hourly, plus 1-1/2% b.) final excess pay Max also c.) applies to Excess Benefit.	a.) b.) Same as Hourly. c. Workmen's Compensation	a. Age 60 and 15 years. b. Reduction based on attained age & yrs. of service after age 35. c. With consent of Company.	a. Age 55 & 7 yrs. member (10 yrs. serv) Only service after age 35. b. No contributory plan.

A. V. ROE CANADA LIMITED

APPENDIX - EXHIBIT 5(b)

Amount of Monthly Pension Payable at Age 65

Brief Outline of Non-Contributory Pension Plans

	Constant or Minimum Benefit				Monthly Pay at Which Percentage Benefit	Assuming Final Average Monthly Pay is $400 and Average Career Pay is $350				Assuming Final Average Monthly Pay is $450 and Average Career Pay is $400			
	Age 25	Age 35	Age 45	Age 55	Takes Effect	Age 25	Age 35	Age 45	Age 55	Age 25	Age 35	Age 45	Age 55
Ford - Canada 1/	($90.00) $130.00	($67.50) $107.50	($45.00) $ 77.00	($22.50) $38.50	N.A.	($90.00) $130.00	($67.50) $107.50	($45.00) $77.00	($22.50) $38.50	($90.00) $130.00	($67.50) $107.50	($45.00) $77.00	($22.50) $38.50
Westinghouse - Canada 2/	110.00	82.50	55.00	27.50	N.A.	110.00	82.50	55.00	27.50	110.00	82.50	55.00	27.50
General Motors - Canada - Hourly	100.00	77.50	53.00	26.50	N.A.	100.00	77.50	53.00	26.50	100.00	77.50	53.00	26.50
General Motors - Canada - Salaried*	100.00	77.50	53.00	26.50	$375	106.00	82.00	56.00	28.00	118.00	91.00	62.00	31.00
General Motors - U. S. - Hourly	90.00	67.50	45.00	22.50	N.A.	90.00	67.50	45.00	22.50	90.00	67.50	45.00	22.50
General Motors - U.S. - Salaried*	90.00	67.50	45.00	22.50	$375	96.00	72.00	48.00	24.00	108.00	81.00	54.00	27.00
Union Carbide & Carbon - U.S.- Proposed	N.A.	N.A.	N.A.	N.A.	All Pay	176.00	132.00	88.00	44.00	198.00	148.50	99.00	49.50
U.S. Steel - Hourly - Salaried	75.00	75.00	50.00	Nil	All Pay	75.00	75.00	50.00	N.E.	95.00	75.00	50.00	N.E.
Westinghouse - U.S. Hourly-Salaried*	90.00	67.50	45.00	22.50	N.A.	90.00	67.50	45.00	22.50	90.00	67.50	45.00	22.50
North American Aviation - Hourly	52.50	52.50	35.00	17.50	N.A.	52.50	52.50	35.00	17.50	52.50	52.50	35.00	17.50
North American Aviation - Salaried	52.50	52.50	35.00	17.50	$350	75.00	75.00	50.00	25.00	97.50	97.50	65.00	32.50

Ford - Canada = $2.25; plus $1.60 (max. 25 years) payable from retirement age over 65 to age 70.
Westinghouse Electric - Canada = $2.75
General Motors - Canada - Hourly = $2.25 plus .40 (max. 25 years).
General Motors - Canada - Salaried = Same as Hourly plus .6% Final Excess Pay over $375.00.
General Motors - U.S. - Hourly = $2.25
General Motors - U.S. - Salaried = Same as Hourly plus .6% Final Excess Pay over $375.00.
Union Carbide & Carbon - U.S. - Proposed = 1.1% of Final Pay.
U. S. Steel - Hourly - Salaried = 1% of Final Pay minus $85.00; minimum $2.50 ($2.40 prior to 11-1-57); 30 yrs. maximum on the min. benefit.
Westinghouse Electric - U.S. - Hourly & Salaried = $2.25 after 1-1-56 ($2.00 before).
North American Aviation- Hourly = $1.75 (maximum $52.50).
North American Aviation- Salaried = Same as Hourly plus 1-1/2% Final Excess Pay over $350.00 (maximum 30 years).

NOTE: *These Companies also have a Contributory Plan for Salaried Employees.

1/ Figures in parentheses are benefits payable after age 70.
2/ Not eligible at age 65; normal retirement age is 70. Above entries are amounts of pension accrued to age 65 (but not payable until age 70).

N.A. - Not Applicable
N.E. - Not Eligible

A. V. ROE CANADA LIMITED

Brief Outline of Contributory Pension Plans

	I. NORMAL RETIREMENT a. Eligibility b. Benefit Accrual Per Yr. of Service c. Automatic Retirement Age	II. DISABILITY RETIREMENT a. Eligibility b. Benefit c. Inclusive of Federal Benefits	III. EARLY RETIREMENT a. Eligibility b. Reduction Per Month Under Age 65 c. Other	IV. MISCELLANEOUS a. Vesting
I. Avro - Salaried (Employee contributes 5% of Basic Salary)	a. Age 65;* 2-yr. eligibility to join and must then be under age 55 (F 50). b. 1-1/2% of current pay.	a. Any Age b. Accrued benefits, actuarially reduced.	a. Age 55 b. Accrued benefits, actuarially reduced.	a. 5% per yr. for 1st 10 yrs; 10% thereafter per yr.; 100% after 15 yrs.
II. Canadian Steel Improvement-Salaried (Employee contributes 5% of Basic Salary)	a. Age 65;* 2-yr. eligibility to join and must then be under age 55 (F 50); 5-yr. guarantee. b. 1-1/2% of current pay.	a. Any Age b. Accrued benefits, actuarially reduced.	a. Age 55 b. Accrued benefits, actuarially reduced.	a. 5% per yr. for 1st 10 yrs.; 10% thereafter per yr.; 100% after 15 yrs.
III. Canadian Car & Foundry - Hourly & Salaried 1/ (Employee pays 5% of total earnings)	a. Age 65;* 3-yr. eligibility to join; hired under age 50; 5-yr. guarantee. b. 1-1/2% of current pay.	a. None, as such. See early retirement.	a. Age 55 b. Accrued benefits, actuarially reduced.	a. 50% after 10 yrs.; increasing 10% per yr. thereafter; 100% after 15 yrs.
IV. Canadair - Hourly & Salaried 1/ (Employee contributes 5% of earnings)	a. Age 65; 1-yr. eligibility to join. b. 1-3/4% of current pay; minimum flat $20 if joined prior to 55th birthday; 3-yr. guarantee. c. Provision for later employment.	a. None, as such.	a. Age 55 and 20 yrs.	a. After 10 yrs. service; 10% p.a. thereafter.

1/ Credit for Past Service also given to Salaried Employees.

Note: All Plans provide for return of employee's contributions in event of death prior to retirement (and all but Avro allow interest).

* Female age 60.

A. V. ROE CANADA LIMITED

Contributory Plans 1/

Amount of Monthly Pension Payable at Age 65

	Assuming Final Average 3/ Monthly Pay is $400 and Average Career Pay is $350				Assuming Final Average 3/ Monthly Pay is $450 and Average Career Pay is $400			
	Age 25	Age 35	Age 45	Age 55	Age 25	Age 35	Age 45	Age 55
Avro Aircraft Limited - Salaried	$210.00	$157.50	$105.00	N.E.	$240.00	$180.00	$120.00	N.E.
Canadian Steel Improvement Limited - Salaried	210.00	157.50	105.00	N.E.	240.00	180.00	120.00	N.E.
Canadian Car & Foundry Co. Limited - Hourly	210.00	157.50	105.00	N.E.	240.00	180.00	120.00	N.E.
Canadian Car & Foundry Co. Limited - Salaried 2/	210.00	157.50	105.00	N.E.	240.00	180.00	120.00	N.E.
- - - - - - -								
Canadair - Hourly and Salaried 2/	$245.00	$183.75	$122.50	$61.25	$280.00	$210.00	$140.00	$70.00

Avro Aircraft Limited - Salaried	(2-year waiting period)	Benefit Accrual each year is 1-1/2% of Pay. Employee contributes 5% of Pay.
Canadian Steel Improvement Limited - Salaried	(2-year waiting period)	
Canadian Car & Foundry Co. Limited - Hourly	(3-year waiting period)	
Canadian Car & Foundry Co. Limited - Salaried 2/	(3-year waiting period)	
- - - - - - -		
Canadair - Hourly and Salaried 2/	1-year waiting period	Benefit Accrual each year is 1-3/4% of Pay. Employee contributes 5% of Pay.

1/ The age shown here is age upon becoming member, i.e., after an eligibility waiting period.

2/ Credit for Past Service is also given to Salaried Employees.

3/ All Plans in this table base benefits on average career pay; final average pay is also shown because it is applicable to the noncontributory Plans (see previous table).

N.E. - Not Eligible.

Preliminary Report
Feb. 15, 1957

Actuarial Report re Employee
Benefit Program for Employees of

A. V. ROE CANADA LIMITED
AND SUBSIDIARY COMPANIES

PART I

February 13, 1957

Actuarial Report re Employee Benefit Program for Employees of

A. V. ROE CANADA LIMITED AND SUBSIDIARY COMPANIES

PART I

A. INTRODUCTION

The purpose of this actuarial analysis is

(a) To review the report captioned "Proposed Security Plan" prepared by certain associates of A. V. Roe and to explore the feasibility of certain alternate benefits.

(b) To determine appropriate cost figures for the benefits described in that report and for alternate benefits.

(c) To investigate the matter of extending these benefits to the employees of all subsidiaries.

(d) To consider for salaried employees the supplementation of the basic benefits to be provided the wage earning employees.

(e) To determine the cost of such supplementary benefits.

This section of the report, designated Part I, treats in the main with the first two items listed above, and with special emphasis on the aforementioned report captioned "Proposed Security Plan."

The matter of extending the basic benefits to other subsidiaries and the considerations relative to the extension of these benefits (and the supplementation thereof) may be analyzed later.

B. COMMENTARY ON PROPOSED SECURITY PLAN

The basic principle upon which the Proposed Security Plan is established is that the funds contributed by the employer to provide employee benefits are indirect pay for services rendered. The majority of employees are to enjoy at least in part if not in total, this deferred compensation in the form of fringe benefits.

The philosophy is sound and this philosophy, perhaps better than any other, justifies the cost of employee benefits. Nevertheless, it is important to bear in mind that it is not possible to attain equity in such an arrangement. For instance, the deferred pay of the employee who terminates employment before attaining a fully vested position has been diverted from him. Also there is a great disparity in the cost of a unit of benefit according to the ages of the employees and, for some benefits, also according to sex. It is therefore possible to maintain that there is equity among employees under the deferred pay principle in only the very broadest sense.

In reading the report "Proposed Security Plan" the impression is sometimes given that economies may be obtained under an "integrated" plan, i.e., one which makes provision for several different benefit forms under one program rather than having each separate benefit set up separately and independently of all others. Any such economies could come about only by reducing benefits. The cost is identical from an actuarial standpoint whether or not the program is "integrated." (Possibly there may be some savings in administrative expenses through using one administrative agency rather than two or more but this would seem to be a relatively minor item.)

Outside of these basic observations there is little in this report on which we can comment in a general manner. It is apparent that the matter of employee benefits for this group of employees has been carefully and extensively studied. The arrangement set out in this report does, in the main, conform to our own opinion as to what constitutes a suitable program. There are a few areas where we feel suggestions may be in order and these will be mentioned as we now consider the separate provisions of the proposed plan.

1. Eligibility

Essentially - After three consecutive calendar months of full-time employment.

Comment - The provision is appropriate. For a noncontributory pension plan there is no need for even a three months waiting period but because the noncontributory plan may be supplemented by a contributory one the eligibility condition as proposed is desirable.

2. Pension Formula

Essentially - 1% of "total wages" earned during participation in the plan.

Comment - The pros and cons of the per-cent-of-compensation type of formula as compared with the flat-benefit type (e.g., $2.25 per month per year of credited service) have been adequately set out in the "Proposed Security Plan" report.

The fact that for the average higher-wage employee the proposed benefit formula is currently more generous than contained in plans of other large Canadian companies has been recognized. The experience under negotiated plans has been in the direction of increasing pension accruals with each succeeding negotiation and it is to be expected that the trend will continue. The 1% of compensation formula, while more generous currently than these other plans, has the advantage of making automatic adjustments to accord with increasing wage rates at least insofar as current accruals are concerned. For this reason it might be expected to ease somewhat the pressure toward increasing benefit accrual rates (both for past service and future service), which may be expected under the flat benefit type of formula, although the career average type of formula (such as this one) will not produce adequate pension benefits if inflation should continue.

We would recommend, however, that the 1% benefit accrual rate be applied to base wages exclusive of overtime, shift premiums, etc.

3. Vesting

Essentially - No vesting for the first three years of service with accumulative vesting at the rate of 10% per year for each year after the third up to 100% in the 13th year.

Comment - The inclusion of some degree of vesting in negotiated pension plans is becoming more widespread and it is likely to be insisted on by the unions in future negotiations.

While we are cognizant of the desirability of fairly early vesting under the "deferred compensation" philosophy, we nevertheless feel that the schedule proposed might be somewhat improved if vesting were deferred a little longer, and perhaps a somewhat "heavier" scale vesting were adopted after such service.

Take the employee who has participated in the plan for four years. If his annual compensation rate for pension plan purposes is $4,000 then the proposed vesting schedule would entitle him to 10% of 1% x 4 years x $4,000 or an annual benefit deferred to age 68 of only $16 a year. This is what is usually termed a nuisance amount and the administrative expense of keeping track of many such small deferred vested amounts usually justifies the inclusion in a pension plan of a provision to the effect that benefits less than some predetermined amount, say $10 a month (but sometimes even as low as $10 a quarter), be paid off currently in cash equivalents or alternately that when the present value of the deferred pension is less than, say, $1,500 it shall be paid off in a cash equivalent.

We feel, however, that even a provision for a cash payment of these small benefits really accomplishes very little for either the employer or the employee and we would prefer a vesting arrangement (obviating the necessity of including a cash equivalence clause), say, of 50% vesting after the 10th year. Then this percentage would increase by 10% per year up to 100% after 15th year. Alternatively, if this should seem too restrictive, a schedule providing, say, 50% in the eighth year, 75% in the ninth and 100% in the 10th might be considered. This would conform more closely to the 10-year vesting provisions in some negotiated pension plans and yet would tend to avoid the sharp break which occurs when full vesting only is granted after a period of service.

Other schedules are, of course, possible. Perhaps the following tabulation will be helpful in this connection.

TABLE A-1

Vested Equities of Employees Terminating Employment

Employee Earning $4,000 per Year

Continuous Service with the Company	Accrued Annual Benefit at Beginning of Period	Vesting on Basis of Report %	Vesting on Basis of Report Annual Benefit 3/	Vesting on Alternate A 1/ %	Vesting on Alternate A 1/ Annual Benefit 3/	Vesting on Alternate B 2/ %	Vesting on Alternate B 2/ Annual Benefit 3/
0 - 1 year	$ 0	0%	$ 0	0%	$ 0	0%	$ 0
1 - 2 years	40	0	0	0	0	0	0
2 - 3 years	80	0	0	0	0	0	0
3 - 4 years	120	10	12	0	0	0	0
4 - 5 years	160	20	32	0	0	0	0
5 - 6 years	200	30	60	0	0	0	0
6 - 7 years	240	40	96	0	0	0	0
7 - 8 years	280	50	140	0	0	50	140
8 - 9 years	320	60	192	0	0	75	240
9 - 10 years	360	70	252	50	180	100	360
10 - 11 years	400	80	320	60	240	100	400
11 - 12 years	440	90	396	70	308	100	440
12 - 13 years	480	100	480	80	384	100	480
13 - 14 years	520	100	520	90	468	100	520
14 - 15 years	560	100	560	100	560	100	560

1/ 50% after 10 years, 60% after 11 years, etc. to 100% after 15 years.

2/ 50% in 8th year, 75% in the 9th year, 100% in the 10th year.

3/ Deferred to age 68.

It is presumed that continuous service with the Company for vesting purposes includes service prior to the effective date of the Plan as well as service after such date.

4. Normal Retirement Age

Essentially - Age 68.

Comment - This provision is appropriate. Thinking is more and more in the direction of a normal retirement age beyond 65. It is not unlikely, however, that the union will request age 65 as the normal retirement age but with pension accruals being granted for service beyond age 65. In this connection a recent discussion of retirement ages indicated that unions were becoming more amenable to an automatic retirement age, even as low as age 65. The reasons cited were the increasing emphasis on automation involving skills more readily learned by younger men and the fact that private pension plans were now providing more attractive benefits. One point which should be kept in mind. If very many employees were to be retired below age 68 at Company option (i.e., at full accrued pension) and these were not counterbalanced by employees retiring at postponed retirement ages (i.e., after age 68) the average retirement age would be less than 68 and contributions determined on the basis of an age 68 average retirement age would become inadequate.

5. Early Retirement

Essentially - Down to age 60 with full accrued benefit if requested to retire by the Company and with a reduction in benefit accrued to such date of retirement of .6% for each month of early retirement if the employee requests early retirement.

Comment - This differentiation between the benefits granted according to which party initiates the request for early retirement is becoming increasingly popular. We understand that in practice it has been a desirable provision. It can, or course, lead to an employee making himself persona non grata just to retire early at the larger pension. No doubt in the Plan itself suitable wording would be included to cover this possibility (e.g., full accrued benefits might be granted under situations where the early retirement would take place under conditions which were mutually satisfactory to employer and employee).

6. Postponed Retirement

Essentially - At Company's request only. Benefits accrue in respect of service after age 68.

Comment - When an employee gets past normal retirement age the value of his pension accrued to normal retirement age decreases. The crediting of service after N.R.A. by increasing the benefit tends to offset the decrease in value. Nevertheless many employers prefer to cut off credited service at normal retirement date because the granting of additional benefits tends to make continued employment too attractive. Even though such continuation may be only at the request of the employer, influence may sometimes be exerted where a negotiated plan is involved, for the continuance of employees beyond normal retirement date in cases which are not always in the employer's interest and such pressure may be emphasized where pension accruals continue beyond Normal Retirement Age (or where benefits to late retirees are actuarially increased).

Even though it may seem to conflict a little with the deferred compensation approach, we feel that no pension accruals should be granted for service after normal retirement date - although some modification should probably be made for older employees covered at the effective date of the Plan to give them an opportunity to increase their benefit credits (which are based only on future service).

The following table will illustrate the present value of pension benefits at ages 68, 69 and 70.

TABLE A-2

Comparative Value of Pension Accruals of $1 per year 1/ at Retirement

Age Employee (male) Enters Plan	Retirement Age 68 N.R.A.	68 Credited to Service Retirement-Age	69 N.R.A.	69 Credited to Service Retirement Age	70 N.R.A.	70 Credited to Service Retirement Age
30	364	do.	327	335	292	308
40	268	do.	241	249	215	231
50	172	do.	155	163	139	154
60	77	do.	69	77	62	77

1/ For example, the benefit at age 68 for employee entering at age 30 is $38, for employee entering at 40 it is $28, etc.

This table shows that except for employees entering the Plan at advanced ages, the value of the accrued benefits drops as the employee grows older (beyond N.R.A.) even if pension accruals are granted for the additional period.

7. Pension Guarantee

Essentially - Pensions will be paid for 120 months and for life thereafter.

Comment - This is the one provision in the proposed plan which we are inclined to question.

The 10-year C&C (certain and continuous) provision is widely found in individual annuity or insurance annuity contracts but rarely in pension plans unless such plans specifically call for the use of such contracts as the financing medium. These insurance-annuity contracts provide a death benefit and cash surrender value just prior to retirement, so that elimination of such individual equity suddenly at retirement would be awkward. In other words, the 10 C&C feature avoids the apparent forfeiture which seems to arise when an employee dies shortly after retiring under a straight-life annuity. Nevertheless, the forfeiture is apparent rather than real because for any given amount of money the benefits provided under the straight-life annuity at retirement is the precise actuarial equivalent of the reduced amount of life annuity with a 10-year C&C provision.

It might be argued that avoidance of apparent forfeiture is desirable under a pension plan because of the acceptance of the deferred compensation concept. However, as stressed earlier the deferred compensation concept may only be applied in a very broad sense.

Furthermore, the death benefit arrangement which results from the use of group life coverage supplemented with a 10-year C&C feature is difficult to rationalize. It provides the greatest death benefits where the insurance needs are least, ie., at the older ages. It is generally agreed that from the "social" standpoint this insurance is most needed at the younger ages, at least in the case of married male employees. The death benefit system is bound to be complex if any attempt is made to mesh the two death benefits so that the group life insurance controls only to the extent that it exceeds the death benefit under the pension plan.

Furthermore, an element of inflexibility is introduced when death benefits are tied to the amount of pension. It may be that this linkage is desirable initially but it may not be desirable in later years. We know of too many cases where death benefits under such an arrangement grew out of all proportion to the original intent because of inflationary changes in compensation while the pension benefits themselves, in these same instances, actually became inadequate in relation to the increased rates of compensation.

Furthermore, if a plan were to be financed through a trust fund we would not favor any substantial amount of death benefit to be paid from such trust, at least to employees who die before reaching retirement status. (The obvious reason being the geographical concentration of risk with the possibility of catastrophic hazard).

As mentioned earlier in this analysis, we see no real advantage in tying in death benefits with pension benefits and are inclined to believe that they might better be treated independently one of the other.

The point will be made perhaps that since the 10 CAC approach is one which grants a decreasing death benefit for only a limited period after retirement takes place, it avoids the high costs engendered when group life coverage is continued beyond retirement. This depends entirely on how much death benefit is so continued. Unions are pressing for continuation of a modest death benefit after retirement and whether they would be satisfied with an initially larger but decreasing benefit of the 10 CAC type we are not in a position to state.

In one negotiated pension plan (for which we recently acted as consultants) developed for another company in the aviation industry, there was included a flat death benefit after retirement of $1,000 (there was no death benefit from the pension plan before retirement where the group life insurance was operative). Such a modest death benefit after retirement is, we believe, actuarially appropriate under a pension plan even if funded through a trust fund because the potential of catastrophic hazard, arising from geographical concentration, is not pronounced as it is before retirement.

In this instance perhaps consideration could be given to a purely nominal amount of death benefit after retirement, such as $500.

The observation has been made that indiscriminate payment of a death benefit upon the occurrence of an employee's death regardless of the status of the beneficiary serves little useful purpose. If the 10 CAC arrangement should be effected, consideration might be given to restricting the eligible beneficiaries to spouses - even though this would again be a slight deviation from the deferred pay philosophy. As regards the flat $500 type of death benefit the desirability of restricting payment to stipulated classes of beneficiaries is not so evident because such an amount would likely be required in any event for burial expenses.

8. Pension Options

Essentially - Certain actuarial equivalents of the basic benefit.

Comment - The inclusion of these options may be deemed to "correct" the situation discussed just previously. Usually the basic benefit provided is a straight annuity (the largest benefit amount for a given outlay) with the options being somewhat lower amounts of benefit carrying the various guarantees. The reversal from the more usual procedure means that the company will be providing a 1% benefit on a relatively high cost basis (because of the 10 C&C feature) so that an employee may obtain a larger pension by giving up the 10 C&C feature - roughly a 10% to 20% increase in the rate of pension accrual on the average. This is substantially in excess of the 1% rate of benefit that the employer may have felt he was providing. We feel that the preferable arrangement is to devise the pension plan on a straight life annuity and then permit the employee to choose at or near retirement a lower benefit rate with the added death benefit features which he desires.

Incidentally, permitting these options to be selected up to 30 days before retirement can introduce additional costs because the employee can exercise a certain degree of selection against the pension fund. In other words, by permitting a choice as close to retirement as 30 days may result in some benefits selected not being true actuarial equivalents one of the other. There is no objection to permitting these selections on this basis but the employer should be aware that it will undoubtedly increase the ultimate cost of the pension plan to him over what it would be if, for example, such selections were required not later than two years prior to retirement.

9. Service Benefits

Essentially - An employee who retires at or after age 60 with five years of service will receive a minimum benefit of $25.00 per month if he retires at the Company's request and, if he retires at the request of the Company with less than five years' service his benefit will be $5.00 per month per year of service. If he retires at his own request he receives benefits under the 1% accrual rate (presumably reduced by .6% for each month he retires prior to age 65).

Comment - The inclusion of a minimum benefit is desirable to avoid the payment of "nuisance amounts" and because the payment of very small pensions, even if attributable to short service, is not a good public relations policy.

We would suggest that consideration be also given to providing a minimum of $25 per month to all employees who are employed at the effective date of the plan regardless of what their length of service is at retirement and then make the stipulation that an employee hired after the effective date of the plan would have to have five years of covered service in order to obtain the $25 monthly minimum (or to receive any pension benefit).

10. Death Benefits

Essentially - The greater of the present group life schedule or 10 times the accumulated pension benefits ($7,000 maximum death benefit, or-10 times the current rate of annual accrual of pension benefits times the number of years of employee's service ($7,000 maximum death benefit).

Comment - This is a complex death benefit schedule. It will be difficult for many employees to understand and although there may be valid reasons for such a schedule we would not recommend it from an employee relations standpoint.

We have indicated in Table A-3 the amount of death benefit available under a 1% pension plan (NRA, 68) at different durations of coverage.

TABLE A-3

Entry Age	Approximate Amounts of Death Benefit Available[1/] (Males) — Level Earnings $3,000 p.a. 10th Year	20th Year	Level Earnings $4,000 p.a. 10th Year	20th Year	Level Earnings $5,000 p.a. 10th Year	20th Year
20	$1,343	$3,238	$1,791	$4,318	$2,239	$5,397
30	1,662	4,007	2,216	5,342	2,770	6,678
40	2,038	4,913	2,717	6,550	3,397	8,188
50	2,475	-	3,301	-	4,126	-
60	-	-	-	-	-	-

1/ Under Pension Plan if no mortality or withdrawal discount is taken; 3-1/2% interest. Level Premium Funding - Level Premium from entry age to NRA of 68. (The amounts would be somewhat larger in the case of female employees.)

It is apparent from this table that the point at which the death benefit under the pension plan exceeds $3,000 in the case of the employee with $3,000 annual compensation and $5,000 in the case of the two other employees (earning $4,000 and $5,000 annually, respectively) varies widely with the age at which they enter the plan.

An interesting point is this. If the group insurance policy is to pay the death benefit up till the time that the employee's reserve under the pension plan takes over, then whenever an employee dies with a reserve below the group insurance schedule his entire reserve (no discount for mortality) would be released as a credit under the plan. If he dies after the reserve reaches the group insurance schedule there is released under the pension plan an amount equal to the group insurance schedule. If on the other hand the intent is to provide group insurance for only the difference between the death benefit amount and the amount under the pension plan the amount of such insurance continually decreases for each employee and poses certain underwriting and administrative problems. Also it should be remembered that the group policy contains a conversion feature which may be valued by the employee. Also certain income and other tax considerations should be explored.

The proposal is actuarially involved from the standpoint of carrying out adequate valuations of the plan. Furthermore, it may be productive of litigation.

Our recommendation would be to continue the present group life schedule (or make such modifications therein as may seem desirable). To do so will not seriously violate the deferred pay concept which as a practical matter can never be precise.

11. Disability Benefits

Essentially - The greater of the death benefit or the accrued benefits under the pension plan subject to a $25 minimum for employees with 5 years of service.

Comment - Proposed benefits (a) and (b) as set out in the Proposed Security Plan report read as if they were cash awards (which, of course, would be inadvisable) but we presume the intent is to have the payment in the form of an annuity as would be the case under (c) and (d).

We understand that from an administrative standpoint the employer would in the final analysis have the power to accept or reject each application for T & PD Benefits.

Our main observation is that this proposal again seems to be an extremely complex set of benefits.

Under (b) what does "equivalent" mean? Is this the lifetime annuity determined according to some disability tables which has a present value of 10 times his accumulated pension benefit? If so, how would the disability table be selected? Would it differ according to the type of disability? (For example, if his disablement is caused by an incurable disease his expectation of life may be much different that if it is caused by loss of limbs).

If an employee with five years of service is, say, age 35 when he becomes totally and permanently disabled because of loss of limbs he might be well advised to select $25 a month under (d) rather than the benefit under (a) but who is to determine which is the greater in his particular circumstance? Why should a total and permanent disability case be granted a 10-year C&C provision? His expectation of life is so reduced by the existence of total and permanent disability that addition of the 10 C&C feature is not only costly but might better be applied towards giving him a larger benefit during his shortened (usually) life expectancy. Perhaps the procedure would be to pay a monthly benefit based on (c) or (d) and then make a residual cash payment on death under (a) or (b) if his benefits did not total the greater of these two amounts.

We feel that this benefit, because of its complicated nature, could engender unfavorable employee relationships merely because of the alternative ways as to how benefits are going to be paid. It is not clear what happens where a disabled employee recovers and returns to work.

Our recommendation would be simply to provide a disability benefit equal to the accrued pension benefit without any actuarial reduction and would either apply the benefit under the group life as an offset to this benefit or else grant such group life benefit in addition to the pension benefit.

12. Temporary Severance Benefit

Essentially - An employee on lay-off (beyond 7 working days) is entitled to receive, while on lay-off, $25 a week until he has been paid a total amount equal to $5 times the number of months of service (excluding the first 3 months of service).

Comment - The mechanics of operating the Severance Benefit Plan seem to be very simple. Each employee would have credited to his pension plan account the level annual or monthly "premium" (determined without mortality or withdrawal discount) which would provide at Normal Retirement Age a 1% per year of service pension benefit. (Each time the employee's base compensation rate changed, there would, of course, be an adjustment to this premium.) His account would be accumulated at the established rate of interest (say, 3-1/2%). This account would be preserved for him during any period of lay-off.

Whenever an employee terminated employment without fully vested rights (or died without drawing down his entire account as a death benefit), there would be released such part of his account as was not required for his vested benefit (or death benefit). The amount so released would be credited to a special account from which the Severance Benefits would be paid to employees on lay-off. As we understand it, all that would be necessary to keep track of severance benefit payments would be a simple record of the balance remaining to each employee's credit adjusted for the payments he receives and for his severance benefit accruals.

The principal problem lies in the fact that it might involve an extremely large liability if after many years of full employment a very drastic cut-back should be necessary.

The long range cost of this benefit is not susceptible to actuarial determination. We understand that management has estimated that if all hourly employees were laid off currently the cost for their maximum creditable periods would be of the order of $1,800,000 (or 13-1/2 cents per hour for a period of one year). For each additional year of service credited under the severance benefit credit the added cost would be about 3 cents per hour. On an experience basis we understand that the cost is less than 1 cent per hour.

Two questions which come to mind are (1) Will the union accept this arrangement? (2) If acceptable will the union require that the benefits be vested (i.e., upon severance for any reason except, say, dismissal for cause, the accrued severance benefit credits would be payable)? If this is not to be the case perhaps a better choice of words might be found to describe the benefit, such as "Temporary Severance Benefit" or "Lay-Off Benefit" or "Unemployment Supplement."

The usual criticism of the regular S.U.B. plan is that the employees with longer seniority normally have little need for these benefits and therefore are discriminated against in that all of the employer contributions "go" for benefits on the younger employees usually subject to lay-off. Under the proposed plan, since there is no specific contribution for this benefit, this criticism should be less pronounced. On the other hand, because the benefits for short service employees are small the proposed plan may not "do very much" for them.

We believe the proposed plan merits serious consideration and if the principal beneficiaries under this benefit will be short service employees who do not take with them a vested right under the Pension Plan, then the contributions made under the Pension Plan in their behalf should meet the cost of this Severance Benefit - providing lay-off of these employees tends to result in termination under the Plan. Certainly if these employees would be subject to recurrent lay-off the financial consequences to the Pension Plan might be very serious.

The annual contributions under the Pension Plan for employees entering at representative ages required to accumulate at interest only the present value at age 68 of the 1% pension benefit are set out below:

TABLE A-4

Level Contribution to Provide 1% Per Annum Accrual to Age 68[1/]

Annual Compensation	Age at Entry Into Plan: 20	30	40	50	60
$3,000	$111	$137	$168	$204	$245
4,000	148	183	224	272	327
5,000	184	228	280	340	409

1/ Male employees, Discount for Interest Only at 3-1/2%. No mortality, withdrawals, or disability retirements prior to age 68.

It follows from the above table that the contributions under the Plan (on an interest only basis) exceed $5 a month even at the very young ages. That is, the contributions made in respect of each individual employee greatly exceeds the severance benefit which he accrues for that particular year.

Nevertheless the possibility always remains that a substantial number of lay-offs may arise soon after the pension plan is established and before any substantial amount of funds have been accumulated. Perhaps these benefits should only become effective after the Plan has been in effect for, say, two years; or else the benefit pay-out should not exceed, in the aggregate, some predetermined amount which, in turn, might increase as the duration of the Plan increases.

Supplemental Plan

Offering a non-contributory plan to the hourly employees will, for all practical purposes, necessitate that the same or a comparable plan be offered to the Salaried employees. Ideally, the procedure would be to extend a non-contributory 1% plan in respect of total salary. In view of the favorable tax treatment granted employee contributions to a pension plan in Canada and the fact that a 1% benefit based on career average salary is apt to be somewhat low as a pension benefit for salaried employees when related to the salary enjoyed at or near retirement (especially if there has been any degree of inflation over the years), the proposal of a supplemental plan seems to be a most desirable one.

As we interpret this proposal, the employee would voluntarily contribute, say, 5%, of total compensation (but he could contribute such a higher amount as would be deductible) and these contributions would be applied currently under the money-purchase principle to "purchase" additional benefits or be accumulated to the employee's credit and applied to provide annuities when he retired. Such supplemental benefits would be offered to both wage and salaried employees.

The only point that we would like to make is that some employees may decide not to make the additional contributions even in the light of the favorable tax treatment. Perhaps there would be some merit in supplementing such employee contributions with modest employer amounts (e.g., 25% of employee amounts) in order to make such contributory part still more appealing. We would think that this might be desirable even if it should be necessary to make a slight downward adjustment in the proposed 1% noncontributory formula in order to keep the total company cost within predetermined limits.

It would be necessary, in considering any form of supplementary plan, to pay careful attention to the existing plans covering salaried employees and to the equities in these plans which these employees have accumulated. Accordingly, this matter is only touched on in Part I of this report, but will be the subject for future study.

C. COST CONSIDERATIONS

In this section of the report cost estimates are developed for the proposed noncontributory pension plan for hourly paid employees. There is also indicated the effect on costs of various modifications to the proposed plan, such as changing the normal form of annuity from one providing for annuity payments for life with 10 years payments guaranteed (10 C&C) to a straight life annuity with no death benefit. The cost components are expressed in terms of cost per employee, cost per employee per hour, and cost as per cent of payroll.

All cost figures shown herein are applicable only to the male hourly employees of Avro Aircraft and Orenda Engines combined. It is estimated that to have included the female employees in the computations would have increased the costs roughly 1%, based on the present distribution of employees.

1. BASIC DATA

The basic data consisted of a tabulation showing the number of employees as of November 1956, by year of hire within year of birth, separately for males and females, but for Avro and Orenda combined. Table 1 of the Appendix shows for males, and Table 2 for females, a distribution of these employees by attained age groupings and by years of service groupings. There were 7,573 males and 73 females. The average age of the males was 38 with 4-1/2 years of service on the average; for the females it was age 39 with also 4-1/2 years of service.

The proposed plan is based on compensation received during participation in the plan, and therefore covers future service only. We were informed that the average pay was $4,000 per year and we assumed in our computations that all employees earned exactly this figure. Thus, a 1% of pay plan would accrue each year a yearly annuity, payable monthly, of $40.00 at normal retirement date. Consequently for 30 years of participation in the plan an employee would be entitled to $100 a month at normal retirement date.

2. ACTUARIAL FACTORS

The actual costs of any pension plan will obviously depend on the number of employees, their rates of compensation, and the rates at which they die, become disabled, terminate employment or retire. In making advance provision to meet the actual plan costs as they emerge, it is necessary to make certain assumptions as to the rate of compensation, the rate at which employees will die, become disabled, terminate service or retire, and the rate of interest that will be earned on the average on contributions and on the funds in the plan year in and year out over the span of the plan. In addition, a funding method will have to be assumed. A brief commentary of all of these items follows:

(a) Rate of Compensation: As indicated above, we are assuming that all employees will earn on the average $4,000 a year every year that they are participants in the plan. Depending upon the funding intentions of the plan, a pay scale is oftentimes introduced into a salaried plan with the purpose in mind to level out costs over the years. However, hourly pay scales are normally flat and are modified generally by across-the-board compensation adjustments in the future (rather than by age, service and promotional increases as is the case with salaried employees). For these reasons we are not taking into account any general increases in pay in the future for the hourly group.

(b) Rates of Mortality, Disability, Withdrawal, Termination of Employment and Retirement: We do not have available appropriate data which would enable us to determine experience rates for this particular group of employees and even if we did, we doubt that it would be advisable to use such rates in projecting costs many years into the future. It is necessary then to adopt such rates as, in our judgment, will be realistic as far as the future is concerned, and which will smooth out the random yearly fluctuations.

(i) Rate of Mortality (Active Lives)

We have adopted for this report what we call the Basic 1951 Group Annuity Table projected to 1965. The Group Annuity Table for 1951 was published in 1952, and can be considered representative of recent group annuity mortality experience under insured group annuity plans of life insurance companies. It contains a loading factor of 10% for males and 12-1/2% for females, which is available as a safety factor and for dividends if the experience warrants. In addition, some companies set the age back thereby increasing the safety factor and also allowing some extent for future improvements in mortality. We have taken a more direct approach. First we took the basic table, i.e., without the 10% and 12-1/2% loadings, and then projected this basic table (we used so-called projection scale C to allow for future improvement in mortality).

(ii) Rate of Mortality (Disabled Lives) - (This also includes recoveries from disability):

It has been observed that the death rate among disabled lives varies considerably by age at disability and duration from disability. To reflect these variations would necessitate a voluminous number of tables, so that in practice a short cut has to be used. We have found in our other valuations that using Hunter's Disabled Life Rates of Mortality, which incidentally were published many years ago and which vary by attained age only, produce reasonable cost results and this table was adopted from these calculations.

(iii) Rate of Becoming Disabled:

Recent experience of life insurance companies on their individual policies with a disability benefit indicates a rate of disability about three times Hunter's probabilities of becoming disabled for males and four times for females, and these are the rates we are using in the cost computations.

(iv) Rate of Termination of Employment:

This is the most difficult of all of the actuarial factors to predict, since it varies so much by age and by length of service, and is closely related to economic conditions generally. Because of the liberal vesting of the proposed plan, it is necessary that a conservative set of rates of termination be used. The rates that we have used were derived from the experience of another company and are what we would term modest rates.

(v) Rate of Retirement - (other than disability retirement):

We have valued the proposed plan on the assumption that the normal retirement age will be 68 but, also, have used age 65 as an alternate age. Of course, there will be early retirements entitled to a benefit payable immediately and there will be deferred retirements. In our computations we have assumed that the average retirement age cost-wise is the normal retirement age.

(vi) Comparative Table of Above Rates:

Table 3 of the Appendix contains a brief summary of the actuarial factors. It also has a schedule showing for quinquennial ages the above rates per 1,000, separately for males and females.

We are also showing another table in the Appendix; namely, Table 4 which sets out the number of deaths, withdrawals, disabilities and retirements arising out of an assumed 100,000 new entrants at various ages. The table is in two parts, Part A which shows all of the decremental factors used in this report and Part B which shows the results if death were the only decrement. From Part A of this Table 4, it will be observed that the withdrawals have been conservatively taken, except for the very young ages where there is a high withdrawal rate in actual experience and where the effect of withdrawals on costs is not too great.

c. Rate of Interest:

The rate of interest has a considerable effect on the costs of a pension plan and it is also one of the cost elements which the Actuary normally does not select except that he must be satisfied that the rate finally adopted is one which may reasonably be expected to materialize in actual experience. We were requested to make two sets of valuations, one on the basis of 3-1/2% and the other on 4% interest.

d. Funding Method:

We have used the so-called aggregate cost method of funding. Under this method, the total cost for the first year of all future benefits is expressed as a percentage of all future pay of the employees actually participating in the Plan and this percentage applied to the current year's pay will give the first year contribution requirement under the Plan. Therefore, if the future experience duplicates the actuarial assumptions, each subsequent year's contribution will be the same percent of the then current pay.

3. SPECIFICATIONS OF THE PROPOSED PLAN

A brief outline of the plans being valued is contained in Table 5 of the Appendix. In brief, all of the plan modifications valued provide for a benefit accrual of 1% per year, with liberal vesting, with the accrued benefits payable immediately on disability, and with a minimum benefit of $300.00 per year.

4. FIRST YEAR COST OF PROPOSED PLANS

Table 6 of the Appendix shows the cost of the proposed plan and modifications assuming an interest rate of 3-1/2%, and Table 7 of the Appendix shows the corresponding costs at 4% interest. Other pertinent data is also shown in these tables. As previously mentioned, these are the costs for males only and dollar amounts should be increased roughly 1% to include the costs for females. While we show in these tables the costs per employee, per employee per hour, and as a percent of payroll, we are quoting costs below only in terms of payroll because that seems to be the appropriate cost index in respect of a plan with pension accruals related to pay. Also, it is necessary to have a basic plan with which to compare modifications and for this purpose we are using a normal retirement age of 68 with a 3-1/2% interest rate and the straight life annuity without any death benefit. Also, in order to facilitate reference to these tables, we are showing the amounts in dollars.

Table B-1 following gives a comparison of the costs, both in amount and in percent of payroll, for the basic plan and for various modifications to it.

TABLE B-1

COST OF BASIC PLAN AND MODIFICATIONS THEREOF
(Age Retirements and Disability Retirements Combined)
(The figures in parentheses are the per cent cost increases or decreases relative to the basic plan)

Interest Rate	Normal Retirement Age	Form of Annuity	Amount of Contribution	First Year Contribution Requirement as % of Payroll	% Increase or decrease (-) over Basic Proposal
3-1/2%	68	Straight Life	$1,193,000	3.94%	Basic
3-1/2	68	5 Years C & C	1,252,000	4.13	5.0%
3-1/2	68	10 Years C & C	1,414,000	4.67	18.6
3-1/2%	65	Straight Life	$1,435,000	4.74%	20.3%
3-1/2	65	5 Years C & C	1,489,000	4.91	24.8
3-1/2	65	10 Years C & C	1,638,000	5.41	37.3
4	68	Straight Life	$1,079,000	3.56%	(-9.5)%
4	68	5 Years C & C	1,133,000	3.74	(-4.9)%
4	68	10 Years C & C	1,281,000	4.23	7.4
4	65	Straight Life	$1,303,000	4.30%	9.2%
4	65	5 Years C & C	1,353,000	4.47	13.5
4	65	10 Years C & C	1,489,000	4.92	24.8

(a) Effect of Providing a Life Annuity with Death Benefit:

Whether a noncontributory pension plan should provide death benefits after retirement of the type herein considered (i.e., 5 Years C & C or 10 Years C & C) is of course debatable because the death benefit would be related to pension benefits and hence would be different for different employees depending on the amount of their pension benefit, whereas normally a death benefit would be related to pay or would be a flat amount for all employees. Furthermore, the cost is increased considerably over the cost for a straight life annuity, the disability costs even more than the age retirement costs, as can be seen from the following Table 2.

TABLE B-2

First Year Contribution Requirement
Normal Retirement Age 68 - 3-1/2% Interest

Type of Life Annuity	Initial Annual Contribution Requirement for Age Retirement	Disability Retirement	Total
1. Straight Life	$1,023,556	$169,366	$1,192,922
2. 5 Years C & C	1,062,762 (4%)	189,690 (12%)	1,252,452 (5%)
3. 10 Years C & C	1,177,141 (15%)	237,113 (40%)	1,414,254 (19%)

Note: Figures in parentheses are percentage increases over line (1).

The reason for the relatively larger increases for disability costs is that the death rate among disabled lives is much higher than for active and other retired lives and consequently the cost of a no-death benefit annuity is comparatively small.

(b) Effect of Interest Rate:

Increasing the interest rate from 3-1/2% to 4% reduces the cost about 9.5% for normal retirement age 68.

(c) Effect of Change in Normal Retirement Age:

A substantial increase (20.3%) in costs results from assuming employees will retire at age 65 instead of age 68. Conversely, if the actual retirement age were less than 68, the plan would not be adequately funded if age 68 were assumed to be the average retirement age.

(d) Effect of Minimum Benefit of $300 per Year:

The effect of paying only the accrued benefits at retirement, which naturally only applies to the older employees, instead of a minimum of $300 a year, is as follows, based on age retirement costs only and on a straight life annuity basis:

TABLE B-3

Liability for Minimum Benefit

	N.R.A. - 68 3-1/2% Interest	N.R.A. - 65 3-1/2% Interest
(1) Present value of all proposed benefits including the minimum	$12,270,160	$14,475,337
(2) Present value of the excess of the minimum over the accrued benefits	309,194	637,676

Of course, the effect of a life annuity with a term certain would be even greater because of the greater effect of such a guarantee at the older ages.

5. REPRESENTATIVE GROUP LIFE INSURANCE COSTS:

The one-year term cost to provide all active male employees (costs would be increased about 1% if females included) with $1,000 of life insurance is $68,250 based on the group "B" rates. This works out to be about $9.00 per $1,000 of insurance protection. These rates are life insurance company rates and hence include margins; the actual experience costs might work out to between one-half and two-thirds of these costs.

To provide $500 of paid-up life insurance at normal retirement, would require an annual premium of about $75,000, using the actuarial factors in this report. This cost is based on a normal retirement age of 68.

Some of these group insurance costs may appear to be a little high and that is because there is now quite a number of employees currently close to or above normal retirement age and normally, the latter, at least, would be retired if there were a pension plan in effect, so that costs would, in the future, be based only on employees who are below the normal retirement age.

6. INITIAL ANNUAL CONTRIBUTION REQUIREMENT ON PROPOSED FUNDING APPROACH:

The cost tables set out in the Appendix hereto have been determined taking into account discounts for turnover, mortality and disability. Such calculations may have to be prepared in order to support the deductibility from taxable income of the contributions made under the Plan. They also are reasonably indicative of the long range cost of the proposed pension plan.

On the other hand the proposed funding procedure for the proposed security plan is quite different from the methods used in the Appendix Tables. Fundamentally, the suggestion is to establish what is tantamount to a "savings" account for each covered employee into which account there will be deposited periodically (annually, monthly or more frequently) the amount which, if accumulated at interest only would provide at normal retirement the estimated single premium for his pension benefit. To the extent that such accumulations are released on account of (a) non-vested terminations, (b) excess of amounts released from his account over a death benefit paid therefrom, (c) credits arising from postponed retirements, (d) gains from total and permanent disability pensions, etc., there would be established a sort of side fund which will be used to pay the Severance Benefits. Presumably it would also be drawn upon whenever any other situations required (e.g., pension benefits granted without actuarial reduction for retirements below the normal retirement age).

As a matter of interest, we have determined the initial annual contribution requirement for the 1% pension formula (with a minimum benefit of $25 a month) on the interest only basis and the results are as follows:

TABLE B-4

Initial Annual Contribution Requirement 1/

	Aggregate Cost Method	Individual Funding to Retirement
Amount of Contribution	$1,471,200	$1,965,500
Amount per Employee	$ 194	$ 260
Amount in cents per hour (2000 hours per year)	9.7¢	13.0¢
Amount as Percent of Payroll ($4,000 Annual Pay)	4.9%	6.5%

1/ Interest only to age 68, mortality and interest thereafter.

We were also requested to make an estimate of what the Pension Plan for Hourly-Rate Employees of Canadian Subsidiary Companies of General Motors Corporation would cost for the Avro and Orenda hourly employees. We did not have time to make a detailed calculation but, using the same actuarial factors that were used for the other calculations herein, we find that the first year contribution under the General Motors Canadian Hourly Plan (which gives credit for all service both past and future) would be about $1,103,000 on the assumption of normal retirement age 68 and with an interest rate of 3-1/2%. This figure is close to the $1,193,000 amount shown in Table B-1 for the Plan herein considered.

* * * * * * * * * * * * * * * * * * *

We trust that this report will assist you in your consideration of a pension plan. We will proceed with Part II of this report, and will be pleased to carry out such further analyses as you may suggest.

RESPECTFULLY SUBMITTED,

THE WYATT COMPANY

By: James A. Hamilton

James A. Hamilton, F.S.A.

By: Henry G. Meebe

Henry G. Meebe, F.S.A.

Table 1

AVRO AIRCRAFT AND ORENDA ENGINES

HOURLY PAID EMPLOYEES - MALES ONLY

CENSUS AS OF NOVEMBER, 1956

Distribution by Attained Age in 1956 and Length of Service

Attained Age in 1956	Years of Service: Under 1 Year	1 Year but Under 3 Years	3 Years But Under 6 Years	6 Years But Under 9 Years	9 Years & Over	Total
Under 20	14	11	-	-	-	25
20 - 24	74	99	281	39	-	493
25 - 29	127	188	620	130	4	1069
30 - 34	121	222	897	221	27	1488
35 - 39	90	163	795	199	29	1276
40 - 44	60	152	693	160	45	1110
45 - 49	43	96	484	134	46	803
50 - 54	21	88	338	93	44	584
55 - 59	18	43	210	71	34	376
60 - 64	10	17	129	42	33	231
65 - 69	3	10	31	17	24	85
70 - 74	1	1	5	8	9	24
75 - 79	-	-	2	1	4	7
80 & Over	-	-	-	-	2	2
Subtotal Under 65	578	1,079	4,447	1,089	262	7,455
Subtotal 65 & Over	4	11	38	26	39	118
Grand Total	582	1,090	4,485	1,115	301	7,573

Table 2

AVRO AIRCRAFT AND ORENDA ENGINES

HOURLY PAID EMPLOYEES - Females Only

CENSUS AS OF NOVEMBER, 1956

Distribution by Attained Age in 1956 and Length of Service

Attained Age in 1956	Years of Service: Under 1 Year	1 Year But Under 3 Years	3 Years But Under 6 Years	6 Years But Under 9 Years	9 Years & Over	Total
Under 20	-	-	-	-	-	-
20 - 24	-	1	-	1	-	2
25 - 29	-	-	4	2	-	6
30 - 34	-	1	9	1	-	11
35 - 39	-	1	16	4	1	22
40 - 44	-	1	9	1	1	12
45 - 49	1	2	7	-	-	10
50 - 54	1	1	5	1	1	9
55 & Over	-	-	1	-	-	1
Total	2	7	51	10	3	73

Table 3

AVRO AIRCRAFT AND ORENDA ENGINES

HOURLY PAID EMPLOYEES

Brief Outline of Principal Actuarial Factors 1/

1. Mortality	Basic Group Annuity Table for 1951 projected 14 years to 1965 for males; 5-year age modification for females. Illustrative rates are shown in the Table.
2. Interest Rate	3-1/2% and 4%.
3. Withdrawal Rates	The male rates are based on an analysis of withdrawal rates experienced by another Company. Female rates were taken as 50% greater than male rates.
4. Disability	Three times Hunter's Disability Rates for males and four times for female, combined with Hunter's Ultimate Rate of Mortality among Disabled Lives. Illustrative rates are shown in the Table.
5. Normal Retirement Dates	Ages 65 and 68.
6. Funding Methods	Aggregate cost method. Under this method of funding, the present value of all future benefits for present (and retired, but no retired lives in present valuations) employees, reduced by any reserve funds on hand (none in present valuations) is expressed as a percentage of the present value of all future pay. The resulting percentage applied to the current pay gives the year's contribution. This gives a contribution which is a constant percent of pay.

1/ There were 73 females and 7,573 males in the census that was submitted to us. It is a fair assumption to make that costs herein quoted (which are based on males only) should be increased about 1% to arrive at total costs. In the table of decremental rates, we are also showing rates for females, for comparative purposes.

Table 3 (Continued)

AVRO AIRCRAFT AND ORENDA ENGINES

HOURLY PAID EMPLOYEES

Table of Illustrative Decremental Rates per 1,000 by Attained Age

Attained Age	Death Rate Among Active & Retired Lives		Death Rate Among Disabled Lives	Rate of Disablement		Rate of Withdrawal	
	Males	Females	Males & Females	Males	Females	Males	Females
25	.706	.574	151	1.584	2.112	126	189
30	.923	.706	106	1.683	2.244	80	120
35	1.280	.923	89	1.926	2.568	49	74
40	1.863	1.280	85	2.496	3.328	32	48
45	3.336	1.863	87	3.453	4.604	15	22
50	6.032	3.336	91	5.088	6.784	2	3
55	9.724	6.032	101	8.256	11.008	-	-
60	14.492	9.724	111	16.206	21.608	-	-
65	22.750	14.492	115	-	-	-	-
70	36.619	22.750	115	-	-	-	-
75	60.259	36.619	118	-	-	-	-
80	100.853	60.259	144	-	-	-	-
85	155.717	100.853	236	-	-	-	-

Table 4

DISTRIBUTION OF DECREMENTS AND ACTIVE SURVIVORS

(From an assumed Population of
100,000 at Certain Ages)

PART - A

Assuming Actual Factors Used in Present Cost Estimates

Normal Retirement Age	Entry Age X	Number Entering At Age X	Number of Withdrawals	Number of Disabilities	Deaths	Number Active at N.R.A.
65	22	100,000	82,314	4,263	3,460	9,963
65	30	100,000	50,897	10,336	9,233	29,534
65	38	100,000	21,280	15,306	14,187	49,227
65	45	100,000	5,034	17,097	16,126	61,743
68	22	100,000	82,314	4,263	4,200	9,223
68	30	100,000	50,897	10,336	11,425	27,342
68	38	100,000	21,280	15,306	17,842	45,572
68	45	100,000	5,034	17,097	20,709	57,160

PART - B

Assuming Death is the only Decrement

Normal Retirement Age	Entry Age X	Number Entering At Age X	Number deaths to N.R.A.	Number Alive at N.R.A.
65	22	100,000	20,905	79,095
65	30	100,000	20,440	79,560
65	38	100,000	19,688	80,312
65	45	100,000	18,472	81,528
68	22	100,000	26,776	73,224
68	30	100,000	26,346	73,654
68	38	100,000	25,650	74,350
68	45	100,000	24,524	75,476

Table 5

AVRO AIRCRAFT AND ORENDA ENGINES

Hourly-Paid Employees - Males Only 1/

Brief Outline of Plans Being Valued

1. Employees Covered	Hourly only.
2. Eligibility	Three months of service.
3. Normal Retirement Age	Valuations were made separately for age 65 and age 68. Employees over the Normal Retirement Age at inception of the Plan are assumed to retire one year from the effective date of the Plan.
4. Disability Benefit	Accrued benefits payable immediately.
5. Normal Retirement Benefit	1% per year of future annual pay. We were advised that average annual pay was $4,000 so that we priced an annual benefit accrual of $40. No past service.
6. Normal Form of Benefit	Valuations were made separately for (a) straight life annuity, (b) life annuity with five years' payments guaranteed (5 years C&C), (c) life annuity with 10 years' payments guaranteed (10 years C&C).
7. Vesting	Liberal. Our actuarial factors are based on a modest withdrawal rate.
8. Minimum Benefit	$300.00 per year.
9. Contributions	Company pays all costs.

1/ There were 73 females and 7,573 males in the census that was submitted to us. It is a fair assumption to make that costs herein quoted (which are based on males only) should be increased about 1% to arrive at total costs. In the table of decremental rates we are also showing rates for females, for comparative purposes.

Table 6

AVRO AIRCRAFT AND ORENDA ENGINES

HOURLY PAID EMPLOYEES - MALES ONLY

Census Data and Cost Data Assuming 3-1/2% Interest

Assuming a Minimum Benefit of $300 Per Year

	Normal Retirement Age 68: Age Retirements	Normal Retirement Age 68: Disability Retirements	Normal Retirement Age 68: Total	Normal Retirement Age 65: Age Retirements	Normal Retirement Age 65: Disability Retirements	Normal Retirement Age 65: Total
I. Census Data						
1. Number of Employees						
a. Under N.R.A.			7,520			7,455
b. N.R.A. and Over			53			118
c. Total			7,573			7,573
2. Annual Benefits Being Valued						
a. Under N.R.A.			$8,891,660			$8,009,260
b. N.R.A. and Over			15,900			35,400
c. Total			8,907,560			8,044,660
3. Average Annual Benefit Per Employee						
a. Under N.R.A.			$ 1,182			$ 1,074
b. N.R.A. and Over			300			300
c. Total			1,176			1,062
II. Cost Data						
1. Present Value Cost of Benefits Being Valued						
a. Straight Life Annuity	$12,270,160	$2,030,326	$14,300,486	$14,475,337	$2,030,326	$16,505,663
b. 5 Years C & C	12,740,148	2,273,965	15,014,113	14,844,760	2,273,965	17,118,725
c. 10 Years C & C	14,111,302	2,842,456	16,953,758	15,992,694	2,842,456	18,835,150
2. First Year Contribution Requirement						
a. Straight Life Annuity	$1,023,556	$169,366	$1,192,922	$1,258,696	$176,546	$1,435,242
b. 5 Years C & C	1,062,762	189,690	1,252,452	1,290,819	197,732	1,488,551
c. 10 Years C & C	1,177,141	237,113	1,414,254	1,390,637	247,164	1,637,801
3. First Year Contribution Requirement Per Employee 1/						
a. Straight Life Annuity	$135.16	$22.36	$157.52	$166.21	$23.31	$189.52
b. 5 Years C & C	140.34	25.05	165.38	170.45	26.11	196,56
c. 10 Years C & C	155.44	31.31	186.75	183.63	32.64	216.27
4. First Year Contribution Requirement Per Employee Per Hour 2/						
a. Straight Life Annuity	6.76¢	1.12¢	7.88¢	8.31¢	1.17¢	9.48¢
b. 5 Years C & C	7.02¢	1.25¢	8.27¢	8.52¢	1.31¢	9.83¢
c. 10 Years C & C	7.77¢	1.57¢	9.34¢	9.18¢	1.63¢	10.81¢
5. First Year Contribution Requirement as Percent of Payroll 3/						
a. Straight Life Annuity	3.38%	.56%	3.94%	4.16%	.58%	4.74%
b. 5 Years C & C	3.51	.63	4.13	4.26	.65	4.91
c. 10 Years C & C	3.89	.78	4.67	4.59	.82	5.41

1/ Based on total number of Employees.
2/ Assuming 2,000 hours per year.
3/ Assuming average annual pay of $4,000.

Table 7

AVRO AIRCRAFT AND ORENDA ENGINES
HOURLY PAID EMPLOYEES - MALES ONLY

Census Data and Cost Data Assuming 4% Interest
Assuming a Minimum Benefit of $300 Per Year

	Normal Retirement Age 68			Normal Retirement Age 65		
	Age Retirements	Disability Retirements	Total	Age Retirements	Disability Retirements	Total
I. Census Data						
1. Number of Employees			7,520			7,455
a. Under N.R.A.			7,520			7,455
b. N.R.A. and Over			53			118
c. Total			7,573			7,573
2. Annual Benefits Being Valued						
a. Under N.R.A.			$8,891,660			$8,009,260
b. N.R.A. and Over			15,900			35,400
c. Total			8,907,560			8,044,660
3. Average Annual Benefit Per Employee						
a. Under N.R.A.			$ 1,182			$ 1,074
b. N.R.A. and Over			300			300
c. Total			1,176			1,062
II. Cost Data						
1. Present Value Cost of Benefits Being Valued						
a. Straight Life Annuity	$10,499,645	$1,833,236	$12,332,881	$12,492,286	$1,833,236	$14,325,522
b. 5 Years C & C	10,902,261	2,053,224	12,955,485	12,824,113	2,053,224	14,877,337
c. 10 Years C & C	12,076,485	2,566,530	14,643,015	13,804,409	2,566,530	16,370,939
2. First Year Contribution Requirement						
a. Straight Life Annuity	$ 918,629	$ 160,392	$ 1,079,021	$ 1,136,437	$ 166,772	$ 1,303,209
b. 5 Years C & C	953,854	179,639	1,133,493	1,166,624	186,784	1,353,408
c. 10 Years C & C	1,056,589	224,549	1,281,138	1,255,802	233,480	1,489,282
3. First Year Contribution Requirement Per Employee 1/						
a. Straight Life Annuity	$ 121.30	$ 21.18	$ 142.48	$ 150.06	$ 22.02	$ 172.09
b. 5 Years C & C	125.95	23.72	149.68	154.05	24.66	178.71
c. 10 Years C & C	139.52	29.65	169.17	165.83	30.83	196.66
4. First Year Contribution Requirement Per Employee Per Hour 2/						
a. Straight Life Annuity	6.07¢	1.06¢	7.12¢	7.50¢	1.10¢	8.60¢
b. 5 Years C & C	6.30	1.19	7.48	7.70	1.23	8.94
c. 10 Years C & C	6.98	1.48	8.46	8.29	1.54	9.83
5. First Year Contribution Requirement as Percent of Payroll 3/						
a. Straight Life Annuity	3.03%	.53%	3.56%	3.75%	.55%	4.30%
b. 5 Years C & C	3.15	.59	3.74	3.85	.62	4.47
c. 10 Years C & C	3.49	.74	4.23	4.15	.77	4.92

1/ Based on total number of employees.
2/ Assuming 2,000 hours per year. 3/ Assuming average annual pay $4,000.