1 **Q.   (Reference Application, Customer Service Continuity Plan) For the record, please**
2 **file a copy of the NP report that was submitted for Board approval for the existing**
3 **CSS in the early 1990s.**
4
5 A.   Capital expenditures related to Newfoundland Power's existing Customer Service System
6   were approved by the Board in Order No. P.U. 7 (1996-97). The Board's approval of
7   these expenditures followed the submission of a report by Newfoundland Power in
8   1996.[1] A copy of this report is provided as Attachment A to this response.

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[1]   Pursuant to Board Order No. P.U. 6 (1991), Newfoundland Power was ordered to prepare and file at its next
       rate hearing a Net Present Value analysis of its Customer Service System using an incremental cost/benefit
       approach.

**Customer Service System
Net Present Value Analysis
(1996)**

CUSTOMER SERVICE SYSTEM

NET PRESENT VALUE ANALYSIS

1996 02 23

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1.   INTRODUCTION

In 1989, Newfoundland Light & Power Co. Limited ("the Company") commenced development of a computer-based Customer Service System ("CSS"). The system was intended to replace the Company's old billing system, which had reached the end of its useful life.

During the course of the Company's last General Rate Proceeding, in 1991, the Public Utilities Board ("the Board"), reviewed the CSS project and questioned the methodology used by the Company to calculate the cost benefits associated with its development and implementation. Based on the information presented at the hearing, the Board found the acquisition of the CSS was "prudent in spite of the problems cited in the analysis leading up to the development decision". In its order[1], however, the Board directed the Company to prepare a net present value (NPV), post implementation analysis of the CSS using an incremental cost/benefit approach.

The Board order states:

> "This report must include reasonable assumptions on reduced operating maintenance of the new system versus projected operating maintenance of the old system, the practical and expected used and useful life of the system and any additional costs and benefits such as the benefits of hand held meter readers. It should also use reasonable assumptions on labour costs forecasted for status quo and for the new system. Justification for the discounted cash flow discount rate and period (monthly, quarterly, semi-annually or annually) should be given.
>
> A concise description of qualitative factors also contributing to a decision to introduce a new CSS must also be provided."

2.   OLD BILLING SYSTEM VS. NEW CSS SYSTEM - GENERAL

There are fundamental differences between the old billing system and the new CSS. These differences can best be described and understood in terms of the work that each does and is capable of doing. The old system was, in essence, a manual system with little potential for qualitative improvement and no on-line functionality. In light of evolving standards of customer service, the Company designed the new CSS system as an on-line system that could store and manipulate a greater variety of data, monitor the

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[1] Order No. P.U. 6 (1991), pp. 31 - 32.

ongoing provision of customer services, permit the instant update of customer records, and which would have the flexibility to be modified as customer expectations change.

3. THE OLD SYSTEM

The old billing system provided only basic inquiry functionality, which allowed clerical staff to look up customer names and addresses, the balance owing on an account, the meter reading history, and any bad debts outstanding. The only other functionality of this component of the system was the control of participation in the equal payment plan and the generation of several basic form letters. These functions required manual intervention at each step. Most customer account data could not be maintained on-line, and was stored on tape by billing day. Information for day-to-day inquiry purposes, because of the reliance on monthly manual updating of customer service information, was often unreliable.

The main work of this system was billing. It was done in batch mode, which required that all billing data, such as payments received, meter readings and any appropriate account adjustments, be keyed into the system prior to the batch run. The system would edit the keyed information against data already stored on the system, and produce an error report for all accounts to be billed on the current day. This report was then used to manually correct the data, which was subsequently run again to update the system record. The process was most often done over two days, with the error report being produced one evening and the update being done the following evening.

Because the information contained in the records was inherently not current, proper handling of a customer inquiry required clerical staff to manually check various records and reports. Practically, there was no on-line functionality and, in light of developing standards for customer service, the system was outmoded and, to a great extent, unworkable.

4. THE NEW CSS SYSTEM

(a) General

The new CSS system performs the above-described functions immediately by individual account. The system's work-flow management programming prompts the clerk on what is required, allowing the clerk to complete the data update in a single operation. The updated data is then immediately available on-line to all clerical staff for inquiry and other purposes.

The automation of many functions that were done manually under the old system is another benefit of the new CSS system. For example, collectors' notes are maintained on the new CSS and are available to other staff as required. Under the old system, each collector's notes were kept in the collector's own paper files and were not readily available to others.

On the old system, corrected bills had to be manually calculated and then typed by a stenographer. Adjustments to accounts were manually entered on paper forms and then routed for appropriate approvals. The new CSS allows these tasks to be performed on-line. Corrected bills and adjustments are automatically routed for approvals as required, followed by the automatic update of customers' accounts and, where necessary, the automatic issuance of a new bill.

(b)   Front-line Service Improvements

The greater amount of information stored on-line, and the ready availability of updated data, enhances the Company's level of customer service. Examples of enhanced customer service are:

- The new system records the identity of the Customer Account Representative taking a service request, allowing referral of subsequent customer inquiries to the employee who is most familiar with the matter.

- Requests for final meter readings are maintained on-line. Readings are scheduled automatically, and the customer is billed on the day the meter is read.

- Approximately 150 system checks, designed to automatically recognize anomalies in meter readings, greatly reduce the possibility of an incorrect bill.

- Adjustments to accounts, billing corrections, and non-electric service charges are immediately encoded, ensuring the customer's next bill is accurate to date.

(c)   Administrative Benefits

Along with the benefits that accrue to customers, the new system has facilitated enhancements and efficiencies in the internal administration of the Company's

customer service function.   Examples of significant improvements to internal operations include:

-        Credit, collections, and accounts receivable matters are handled more efficiently and confidently due to the availability of current and accurate account histories.

-        The automation of manual tasks has reduced operating and administrative costs.

-        Regulatory compliance is enhanced by the improved availability of customer information.

-        Cash flow is improved by the shorter billing and collections time frames.

-        The new system's ability to store a wider range of customer information, including demographics, facilitates the precise targeting of customer groups for the provision of special information and services.

-        The new system is sufficiently flexible to accommodate new billing techniques and services, such as group billing and alternate payment plans.

(d)   Productivity.

It is of particular significance that the new CSS system allowed the Company to centralize its customer service function in 1993 without reducing the level of service to customers.

Also made possible by the new CSS system is an automated task assignment and monitoring process known as the "Pending Work Queue". This mechanism monitors the customer account database electronically to determine when manual intervention in the automatic billing process may be required. When the system identifies a required task, the assignment is automatically routed to an employee for completion. If a particular account modification or adjustment is beyond the employee's authority, the system automatically routes the matter to the appropriate supervisor for approval prior to implementation of the revision. Examples of work assignments from the Queue include follow-up on past due accounts, adjustments to customer bills necessitated by inaccurate meter readings, and follow-up on Serviced Premises where no Customer has accepted Service.

The Pending Work Queue substantially reduces paper flow in the Customer Accounting department. It also reduces the need for manual review of accounts and provides useful statistics for productivity management.

The new CSS system has been instrumental in improving employee productivity. Because up-to-date account information is available on-line, employees can respond much faster to customer inquiries and requests for service. Further, as a result of the automation of menial calculations and other tasks, employees are able to engage in more productive activities. In addition, the new system's work-flow technology provides for more efficient routing and scheduling of tasks that still require direct employee involvement.

5. COST

The Company reported to the Board in 1991 that the cost of CSS was $7.5 million. In developing the NPV, the final cost figure employed is $10.173 million. This represents the total amount of the project that was capitalized up to the time the system was considered operational in 1993[2]. The cost overrun resulted from increased costs due to a phased implementation, interest during construction, equipment and office rental, and increased testing and user involvement that were required during commissioning of the system.

As part of the Company's application for research and development tax credits in 1993, the CSS project was audited for Revenue Canada by Monterege Design Inc.[3] Their report stated that "development of the CSS is a multifaceted software MIS application project. Its management and content points to a well managed project that utilized standard, well proven technology to achieve a clearly feasible result."

6. METHODOLOGY

When evaluating a project using a NPV incremental cost/benefit approach, only the incremental change in expenditures, both capital and operating, is analyzed. Reductions

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[2] The $10.173 million figure has not been reduced by the ACOA funding or the research and development tax credit received to help fund the development of the project.

[3] "Report On Eligibility" - Newfoundland Light & Power Co. Limited, 12 January 1993, J.E. Tardy, Consultant, Monterege Design Inc.

in these expenditures (benefits), as well as increases (costs), are netted against each other, including their impacts on tax liability, to yield a net after-tax cash flow. This net cash flow is calculated over the life of the project on either an annual, semi-annual or quarterly basis. The NPV is then calculated by discounting the net cash flow for each period to a common year, usually the beginning of the first time period, and summed together. The cash flows are discounted to account for the time value of money.

A positive NPV indicates that a project generates a return on investment that is greater than the discount rate. A negative NPV indicates a return on investment which is less than the discount rate. In the context of this report, a positive NPV suggests that the benefits associated with the new CSS system justify the costs.

The discount rate employed in the analysis reflects the Company's effective after-tax incremental cost of capital as shown in the table in Schedule 5. This discount rate most accurately reflects the Company's incremental financing costs.

The cash flows in the analysis are calculated and discounted on an annual basis. The Company tracks detailed costs primarily on an annual basis. It would therefore be difficult to determine the expenditures on a semi-annual or quarterly basis.

The NPV analysis is strictly cost-based. All values employed in the analysis are based on quantifiable costs only, as reflected in the Company's accounts. The analysis does not account in any way for qualitative improvements over the status quo, as such elements are extremely difficult, if not impossible, to quantify.

7.   ANALYSIS ASSUMPTIONS

The NPV analysis, which is set out in the attached Schedules, requires comparison of the cost of operations both with and without the new CSS. In order to project these costs, the Company compiled 1990, 1992 and 1995 costs for the customer service function. In 1990, the new CSS had not been implemented; in 1992, a subset of the CSS had been introduced; and in 1995, the system was completely operational.

The analysis assumes that the operating costs of the old billing system from 1990 to 1995 would have escalated at a rate which is derived from the Conference Board of Canada's GDP deflator series for Newfoundland in combination with customer growth (the "Inflator"). This Inflator is based on an analysis of the increase in Customer Service function costs from 1979 to 1989. These cost increases appear to have been driven by a combination of general cost escalation (as indicated by the GDP deflator), and the growth in customers. Beyond 1995, the associated operating costs of both the new system and the old system were projected using a forecast of the Inflator.

As discussed in the Company's 1991 Rate Hearing, a useful life of 20 years was assumed for the CSS computer system. Sensitivity analysis shows that the life would have to be reduced to less than 9 years for the NPV to be negative. Technology change since the conception, development and implementation of the new CSS would appear to indicate that enhancements to the CSS into the future are probable. However, such changes will be incremental and will provide continued productivity benefits. Therefore, the Company believes a projected life of 20 years is a reasonable assumption for the purposes of this analysis.

Labour Overhead accounts for the Company's costs of Worker's Compensation, Canada Pension Plan, Unemployment Insurance, Payroll Tax and Health Benefits. These costs rose by 5% between 1990 and 1995 as shown in Schedule 5 of the Analysis. Since they actually escalated at a faster rate than provided for by the Inflator, these costs were broken out and calculated separately.

The NPV analysis does not include the cost of computer hardware. It was assumed that whether or not the Company developed CSS, hardware additions would be required to support the increased reliance of the Company on computer applications in customer service.

There are on average 5 people working on production support of the new CSS. This is in comparison to 2 people under the old system. The cost of these 3 additional production support staff is shown in Schedule 1.

The Labour benefit of Hand Held Meter Reading was included in the gross total cost for the Customer Service Function while the capital costs are handled explicitly.

The benefit of three days' receivables was calculated on an annual basis as the financing cost reduction associated with the accelerated billing made possible by Hand Held Meter Reading and the new CSS. The Company's after-tax incremental cost of capital was used to determine the financing cost reduction.

8. CONCLUSION

Based on the assumptions in this report, the NPV of the new CSS is reasonably estimated at $3,053,400. Using this analysis, the break-even point of the project would be less than 9 years.

This analysis does not include any consideration of qualitative improvements achieved as a result of the replacement of the old billing system.

NET PRESENT VALUE ANALYSIS

Schedule 1
Page 1 of 2

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
DISCOUNTED CASH FLOW ANALYSIS

YEAR	Net Customer Service Function Cost A	HHMR Support B	Maintenance Costs C	Documentation Costs D	Total Increase In Operating Expenses E	CSS Software F	HHMR Hardware & Software G	Total Investment H	CCA I	GEC J	IDC K	Operating Expenses L	Total Deductions M	Tax Reduction N	Accounts Receivable Benefit To After Tax Financing Costs O	Net After Tax Cash Flow P
			Change In Operating Costs				Capital Expenditures				Tax Deductions					
1990	-	-	-	(250,000)	(250,000)	970,746	-	970,746	273,437	115,270	308,502	(250,000)	447,309	201,289	-	(519,457)
1991	(71,757)	-	-	-	(71,757)	5,522,321	544,269	6,066,590	2,892,917	302,726	353,250	(71,757)	3,477,137	1,564,712	-	(4,430,122)
1992	181,728	13,317	-	-	195,045	1,429,617	10,491	1,440,108	3,322,590	79,284	-	195,045	3,596,919	1,618,613	331,117	314,578
1993	(134,260)	40,063	139,918	-	45,722	147,741	-	147,741	789,135	13,567	-	45,722	848,424	373,307	336,521	516,364
1994	(659,861)	40,370	140,672	-	(478,819)	83,600	-	83,600	141,083	-	-	(478,819)	(337,736)	(148,604)	336,374	582,989
1995	(1,100,222)	37,521	140,672	-	(922,029)	83,600	-	83,600	106,137	-	-	(922,029)	(815,891)	(342,674)	336,413	632,168
1996	(1,154,444)	38,952	146,034	-	(969,459)	83,600	-	83,600	99,376	-	-	(969,459)	(870,083)	(365,435)	349,236	869,660
1997	(1,192,004)	39,765	149,083	-	(1,003,156)	83,600	-	83,600	94,643	-	-	(1,003,156)	(908,513)	(381,576)	356,528	894,509
1998	(1,208,658)	39,849	149,398	-	(1,019,411)	83,600	-	83,600	91,330	-	-	(1,019,411)	(928,081)	(389,794)	357,282	903,299
1999	(1,226,272)	39,961	149,819	-	(1,036,492)	(26,400)	-	(26,400)	89,011	-	-	(1,036,492)	(947,481)	(397,942)	358,288	913,238
2000	(1,230,468)	39,597	148,452	-	(1,042,420)	-	-	-	32,388	-	-	(1,042,420)	(1,010,032)	(424,213)	355,019	999,626
2001	(1,262,354)	40,101	150,345	-	(1,071,908)	-	-	-	(10,549)	-	-	(1,071,908)	(1,082,457)	(454,632)	359,545	976,821
2002	(1,294,861)	40,606	152,237	-	(1,102,018)	-	-	-	1,856	-	-	(1,102,018)	(1,100,162)	(462,068)	364,071	1,004,021
2003	(1,345,211)	41,644	156,127	-	(1,147,441)	-	-	-	1,299	-	-	(1,147,441)	(1,146,142)	(481,379)	373,374	1,039,435
2004	(1,380,134)	42,176	158,125	-	(1,179,833)	-	-	-	909	-	-	(1,179,833)	(1,178,924)	(495,148)	378,151	1,062,836
2005	(1,409,231)	42,513	159,386	-	(1,207,332)	-	-	-	637	-	-	(1,207,332)	(1,206,695)	(506,812)	381,168	1,081,688
2006	(1,440,734)	42,906	160,858	-	(1,236,970)	-	-	-	446	-	-	(1,236,970)	(1,236,525)	(519,340)	384,688	1,102,318
2007	(1,504,297)	44,224	165,800	-	(1,294,274)	-	-	-	312	-	-	(1,294,274)	(1,293,962)	(543,464)	396,505	1,147,315
2008	(1,570,235)	45,570	170,846	-	(1,353,819)	-	-	-	218	-	-	(1,353,819)	(1,353,601)	(568,512)	408,574	1,193,881
2009	(1,643,507)	47,084	176,523	-	(1,419,899)	-	-	-	153	-	-	(1,419,899)	(1,419,746)	(596,294)	422,151	1,245,757
2010	(1,700,569)	48,094	180,308	-	(1,472,168)	-	-	-	107	-	-	(1,472,168)	(1,472,061)	(618,265)	431,203	1,285,105
2011	(1,758,838)	49,103	184,093	-	(1,525,642)	-	-	-	75	-	-	(1,525,642)	(1,525,567)	(640,738)	440,234	1,325,158
2012	(1,824,439)	50,281	188,509	-	(1,585,649)	-	-	-	52	-	-	(1,585,649)	(1,585,597)	(665,951)	450,414	1,370,513
2013	(1,892,480)	51,487	193,030	-	(1,647,963)	-	-	-	37	-	-	(1,647,963)	(1,647,927)	(692,129)	461,626	1,417,460

Net Present Value (Note Q)   8.47%   3,053,480

Schedule 1
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NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
DISCOUNTED CASH FLOW ANALYSIS

NOTES FOR SCHEDULE 1

NOTES: A is the net increase in operating costs associated with the Customer Service Function as compared to the old system. The increase is calculated on Schedule 2.

B is the cost of hardware and software support associated with Hand Held Meter Readers (HHMR). Actuals are used from 1992 to 1995.
Beyond 1995 the amount is increased based on the GDP Deflator Forecast in Schedule 5.

C is the incremental labour costs associated maintaining the new CSS vs the old CSS. In 1995 the 3 additional staff costs $125,600 plus the labour overhead shown in Schedule 5.
For 1993 and 1994, the labour cost for 1995 were used with the appropriate labour overhead added. Beyond 1995, the costs were escalated at the GDP Deflator Index shown in Schedule 5.

D is the costs associated with documenting the old system. This cost was identified in 1989 to help minimize the chance of the old system failing, and poor documentation causing delayed repair.

E is the total increase in operating costs due to the CSS. This is the sum of columns A, B and C.

F is the cost of the CSS system that was capitalized. More details on the capital costs are shown in Schedule 3.

G is the cost of the HHMR that was capitalized. More details on the capital costs are shown in Schedule 3.

H is the total investment associated with CSS software and the HHMR equipment. This is the total of Columns E and F.

I is the CCA tax claim that occurs due to the capital expenditures. The CCA is calculated in Schedule 4.

J is the Capitalized General Expenses (GEC) tax claims that occured due to the capital expenditures. The GEC is calculated in Schedule 4.

K is the Interest During Construction (IDC) tax claims that occured due to the capital expenditures. The IDC is calculated in Schedule 4.

L is the total increase in operating costs as shown in column D.

M is the total income tax deductions. It is the sum of H, I, J and K.

N is the reduction in income tax that occurs as a result of the tax deductions. It is equal to Column L times the tax rate shown in Schedule 5.

O is the reduction in after tax financing costs that occurs from time saved in billing customers due to HHMR & CSS. This benefit is calculated in schedule 6.

P is the Net After Tax Cash Flow. Is is equal to columns M + N - G - D.

Q is the Net Present Value of column O. Column O is discounted using NP's weighted after-tax incremental cost of capital shown in schedule 5.

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
CUSTOMER SERVICE FUNCTION OPERATING COST PROJECTIONS

Schedule 2
Page 1 of 2

Year	Actual Customer Service Function Cost				Customer Service Function Costs Projected With Old CSS				Customer Service Function Costs Projected With The New CSS			
	Labour Function A	Labour Overhead B	Non-Labour C	Total D	Labour Function E	Labour Overhead F	Non-Labour G	Total H	Labour Function I	Labour Overhead J	Non-Labour K	Total L
1990	5,131,668	401,810	587,682	6,121,160	5,131,668	401,810	587,682	6,121,160	5,131,668	401,810	587,682	6,121,160
1991					5,490,673	510,633	628,795	6,630,101	5,466,706	508,404	583,234	6,558,344
1992	5,801,745	580,174	578,786	6,960,705	5,581,607	558,161	639,209	6,778,977	5,801,745	580,174	578,786	6,960,705
1993					5,723,629	652,494	655,474	7,031,596	5,590,310	637,295	669,731	6,897,336
1994					6,030,582	723,670	690,626	7,444,878	5,378,875	645,465	760,677	6,785,017
1995	5,167,440	620,093	851,622	6,639,155	6,269,135	752,296	717,945	7,739,377	5,167,440	620,093	851,622	6,639,155
1996					6,578,098	789,372	753,328	8,120,798	5,422,108	650,653	893,593	6,966,354
1997					6,792,116	815,054	777,838	8,385,008	5,598,516	671,822	922,666	7,193,004
1998					6,887,012	826,441	788,705	8,502,158	5,676,735	681,208	935,557	7,293,500
1999					6,987,375	838,485	800,199	8,626,059	5,759,462	691,135	949,190	7,399,787
2000					7,011,288	841,355	802,937	8,655,580	5,779,172	693,501	952,439	7,425,112
2001					7,192,976	863,157	823,744	8,879,877	5,928,931	711,472	977,120	7,617,523
2002					7,378,203	885,384	844,957	9,108,543	6,081,608	729,793	1,002,282	7,813,682
2003					7,665,102	919,812	877,812	9,462,726	6,318,089	758,171	1,041,255	8,117,515
2004					7,864,095	943,691	900,601	9,708,387	6,482,112	777,853	1,068,287	8,328,253
2005					8,029,889	963,587	919,588	9,913,064	6,618,771	794,253	1,090,809	8,503,833
2006					8,209,396	985,128	940,145	10,134,669	6,766,733	812,008	1,115,194	8,693,935
2007					8,571,581	1,028,590	981,623	10,581,794	7,065,270	847,832	1,164,395	9,077,497
2008					8,947,301	1,073,676	1,024,651	11,045,628	7,374,963	884,996	1,215,434	9,475,393
2009					9,364,807	1,123,777	1,072,464	11,561,048	7,719,100	926,292	1,272,149	9,917,541
2010					9,689,954	1,162,794	1,109,700	11,962,448	7,987,107	958,453	1,316,318	10,261,879
2011					10,021,972	1,202,637	1,147,723	12,372,331	8,260,779	991,293	1,361,421	10,613,493
2012					10,395,772	1,247,493	1,190,531	12,833,796	8,568,890	1,028,267	1,412,199	11,009,356
2013					10,783,471	1,294,017	1,234,930	13,312,418	8,888,458	1,066,615	1,464,866	11,419,938

Schedule 2
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NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
CUSTOMER SERVICE FUNCTION OPERATING COST PROJECTIONS

NOTES FOR SCHEDULE 2

NOTES: A, B, C and D are the actual Customer Service Function costs for 1990, 1992 and 1995.

E is calculated as the labour cost as determined for 1990 escalated to future years. The costs were escalated using a combination of the GDP Deflator Index and the year over year growth in customers. The GDP Deflator Index and the number of customers are shown in Schedule 5. The equation used to inflate the costs to year "n" is:

$$\text{Costs (n)} = \frac{\text{GDP Deflator(n)}}{\text{GDP Deflator (n-1)}} \quad X \quad \frac{\text{Number Customers(n)}}{\text{Number Customer (n-1)}} \quad X \quad \text{Costs (n-1)}$$

F is the labour costs, Column E, times the labour overhead shown in Schedule 5.

G is calculated as the non-labour cost as determined for 1990 escalated to future years. The costs were escalated using a combination of the GDP Deflator Index and the year over year % growth in customers. The GDP Deflator Index and the number of customers are shown in Schedule 5.

H is the total sum of columns E, F and G.

I is calculated from the actual labour cost for 1990, 1992 and 1995. 1991 costs is calculated as the average for years 1990 and 1992. For 1993 and 1994, the costs where interpolated from the costs in 1992 and 1995 using linear interpolation. Beyond 1995 the costs were escalated using a combination of the GDP Deflator Index and the year over year % growth in customers. The GDP Deflator Index and the number of customers are shown in Schedule 5.

J is the labour costs, column I, times the labour overhead shown in Schedule 5.

K is calculated from the actual non-labour cost for 1990, 1992 and 1995. 1991 costs is calculated as the average for years 1990 and 1992. For 1993 and 1994, the costs interpolated from the costs in 1992 and 1995 using linear interpolation. Beyond 1995 the costs were escalated using a combination of the GDP Deflator Index and the year over year % growth in customers. The GDP Deflator Index and the number of customers are shown in Schedule 5.

L is the total sum of columns I, J and K.

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS

CAPITAL COST FOR THE CUSTOMER SERVICE SYSTEM SOFTWARE

Schedule 3
Page 1 of 2

Year	Capital Cost	GEC	IDC[1]	Net In-Service Cost	CIAC[2]	ITC[3]	Net Capitalized
1990	1,996,798	115,270	308,602	2,420,670	1,381,795	68,129	970,746
1991	5,187,645	276,808	348,510	5,812,963	169,556	121,086	5,522,321
1992	1,575,682	78,784	-	1,654,466	-	224,849	1,429,617
1993	271,341	13,567	-	284,908	(110,000)	247,167	147,741
1994	-	-	-	-	(110,000)	26,400	83,600
1995	-	-	-	-	(110,000)	26,400	83,600
1996	-	-	-	-	(110,000)	26,400	83,600
1997	-	-	-	-	(110,000)	26,400	83,600
1998	-	-	-	-	(110,000)	26,400	83,600
1999	-	-	-	-	(110,000)	26,400	83,600
1999	-	-	-	-	-	26,400	(26,400)
Total	9,031,466	484,429	657,112	10,173,007	781,351	846,031	8,545,625

NOTES:

(1) - IDC in 1990 includes $69,677 claimed in 1989.

(2) - The contributions received are partially repayable. Repayment Terms are $110,000 from 1993 to 1999. Contributions are modelled as a reduction to the value of the plant capitalized.

(3) - The ITC received for work done in 1988 and 1989 is shown in 1990. Beyond 1993 an ITC of 24% of the repayment of the ACOA grant is being claimed.

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS

Schedule 3
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CAPITAL COST FOR HAND HELD METER READING SOFTWARE

Year	Capital Cost	GEC	IDC	Net In-Service Cost	CIAC	ITC	Net Capitalized
1990	$0	$0	$0	$0	$0	$0	$0
1991	$268,392	$13,562	$2,844	$284,798	$0	$0	$284,798
1992	$1,275	$64	$0	$1,339	$0	$0	$1,339
Total	$269,667	$13,626	$2,844	$286,137	$0	$0	$286,137

CAPITAL COST FOR HAND HELD METER READING HARDWARE

Year	Capital Cost	GEC	IDC	Net In-Service Cost	CIAC	ITC	Net Capitalized
1990	$0	$0	$0	$0	$0	$0	$0
1991	$245,219	$12,356	$1,896	$259,471	$0	$0	$259,471
1992	$8,716	$436	$0	$9,152	$0	$0	$9,152
Total	$253,935	$12,792	$1,896	$268,623	$0	$0	$268,623

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
ESTIMATED CCA, GEC, AND IDC TAX CLAIMS

Schedule 4
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Year	CSS Software Net Capital Cost Less GEC & IDC (Note A)	CSS Software CCA (Note B)	HHMR Software Net Capital Cost Less GEC & IDC (Note A)	HHMR Software CCA (Note B)	HHMR Hardware Net Capital Cost Less GEC & IDC (Note A)	HHMR Hardware CCA (Note B)	TOTAL CCA DEDUCTIONS	GEC CSS Software (Note C)	GEC HHMR Software (Note C)	GEC HHMR Hardware (Note C)	GEC TOTAL	IDC CSS Software (Note C)	IDC HHMR Software (Note C)	IDC HHMR Hardware (Note C)	IDC TOTAL
1990	546,874	273,437				-	273,437	115,270			115,270	308,602			308,602
1991	4,897,003	2,721,939	268,392	134,196	245,219	36,783	2,892,917	276,808	13,562	12,356	302,726	348,510	2,844	1,896	353,250
1992	1,350,833	3,123,918	1,275	134,834	8,716	63,838	3,322,590	78,784	64	436	79,284				
1993	134,174	742,503		638		45,994	789,135	13,567			13,567				
1994	83,600	108,887				32,196	141,083								
1995	83,600	83,600				22,537	106,137								
1996	83,600	83,600				15,776	99,376								
1997	83,600	83,600				11,043	94,643								
1998	83,600	83,600				7,730	91,330								
1999	83,600	83,600				5,411	89,011								
2000	(26,400)	28,600				3,788	32,388								
2001	-	(13,200)				2,651	(10,549)								
2002						1,856	1,856								
2003						1,299	1,299								
2004						909	909								
2005						637	637								
2006						446	446								
2007						312	312								
2008						218	218								
2009						153	153								
2010						107	107								
2011						75	75								
2012						52	52								
2013						37	37								

NOTES:

A - The Capital Cost applicable for CCA includes those costs capitalized and not claimed as expenses. The Net Capital costs less GEC and IDC were calculated using the numbers in Schedule 3.

B - The CCA was determined using the CCA rates as shown in Schedule 5. It was calculated using the declining balance and the 50% rule for capitalizing additions.

C - The GEC and IDC for the various capital projects are shown in Schedule 3.

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
INPUT FACTORS

Schedule 5
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Year	Tax Rate	GDP Deflator Index[1]	Labour Overhead	Customer Forecast[2]	Software CCA Rate	Hardware CCA Rate
1990	45%	1.183	0.078	192365	100%	30%
1991	45%	1.244	0.093	195730	100%	30%
1992	45%	1.242	0.100	199292	100%	30%
1993	44%	1.255	0.114	202246	100%	30%
1994	44%	1.300	0.120	205716	100%	30%
1995	42%	1.338	0.120	207780	100%	30%
1996	42%	1.389	0.120	210015	100%	30%
1997	42%	1.418	0.120	212413	100%	30%
1998	42%	1.421	0.120	214926	100%	30%
1999	42%	1.425	0.120	217446	100%	30%
2000	42%	1.412	0.120	220199	100%	30%
2001	42%	1.430	0.120	223062	100%	30%
2002	42%	1.448	0.120	225961	100%	30%
2003	42%	1.485	0.120	228899	100%	30%
2004	42%	1.504	0.120	231875	100%	30%
2005	42%	1.516	0.120	234889	100%	30%
2006	42%	1.530	0.120	237942	100%	30%
2007	42%	1.577	0.120	241036	100%	30%
2008	42%	1.625	0.120	244169	100%	30%
2009	42%	1.679	0.120	247343	100%	30%
2010	42%	1.715	0.120	250559	100%	30%
2011	42%	1.751	0.120	253816	100%	30%
2012	42%	1.793	0.120	257116	100%	30%
2013	42%	1.836	0.120	260458	100%	30%

Notes:

1) GDP Impicit Deflator Series for Newfoundland as Projected by the Conference Board of Canada on December 12, 1995.

2) Actual year end number of customers shown from 1990 to 1995. For 1996 to 2000, the number of customers were taken from the customer and energy forecast dated January 20, 1996. Beyond 2000, the number of customers are increase at 1.3% per year.

INCREMENTAL AFTER TAX COST OF CAPITAL

Type	Split	Return	After Tax Return	Total
Debt	50%	8.50%	4.93%	2.47%
Preferred	0%	8.00%	8.00%	0.00%
Common	50%	12.00%	12.00%	6.00%

AFTER TAX DISCOUNT RATE: 8.47%

NEWFOUNDLAND POWER
CSS POST IMPLEMENTATION ANALYSIS
ACCOUNTS RECIEVABLE BENEFIT FOR HAND HELD METER READING AND CSS

Schedule 6
Page 1 of 1

Annual After-Tax Cost of Capital   8.47% (After Tax)

Daily Discount Rate (250 working days)   0.0325%

Annual Revenue through Rates $344,840,000   (1995 Revenue)

3 Day Gain For Annual Revenue: (1) $336,413

Twenty Year Return Prorated on Revenue: (2)

Year	Actual Annual Rev.	After Tax Annual Benefit
1992	$339,411,000	$331,117
1993	$344,950,000	$336,521
1994	$344,800,000	$336,374
1995	$344,840,000	$336,413
1996	$357,984,126	$349,236
1997	$365,458,236	$356,528
1998	$366,231,420	$357,282
1999	$367,262,332	$358,288
2000	$363,911,868	$355,019
2001	$368,550,972	$359,545
2002	$373,190,075	$364,071
2003	$382,726,009	$373,374
2004	$387,622,840	$378,151
2005	$390,715,575	$381,168
2006	$394,323,767	$384,688
2007	$406,436,981	$396,505
2008	$418,807,922	$408,574
2009	$432,725,232	$422,151
2010	$442,003,438	$431,203
2011	$451,281,644	$440,254
2012	$462,106,218	$450,814
2013	$473,188,520	$461,626

Notes:

1) Calculated using the daily discount rate. It assumes a gain of 3 days was achieved by Hand Held Meter Readers and CSS.

2) The annual after-tax benefit was calculated for 1995 and prorates against a projection of revenue based on actual for 1992 to 1995 and escalated beyond 1995 using the GDP Deflator Escalation.