Q. Please provide a copy of the Board's letter of August 19, 1999 referred to in paragraph 4 of the Application.

A. Attached is a copy of the letter and the Joint Report of Newfoundland Hydro and Newfoundland Power referred to in the letter.

NEWFOUNDLAND AND LABRADOR

BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

P.O. Box 21040
St. John's, Newfoundland
Canada
A1A 5B2

Chairperson (709) 726-1133
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Courier

1999 08 19

Ms. Maureen Greene, Q.C.
Vice-President Human Resources,
General Counsel & Corporate Secretary
Newfoundland and Labrador Hydro
P. O. Box 12400
St. John's, NF
A1B 4K7

Dear Ms. Greene:

RE: Guidelines for the Minimum Filing Requirements for New Generation and Transmission Projects on the Island Interconnected System

The Board has recently revisited the above captioned report that was filed jointly by Newfoundland Power Inc. and Newfoundland and Labrador Hydro on July 24, 1998. The Board accepts the recommendations, as presented in the report, and expects that any submissions in the 2000 Capital Budget will reflect these recommendations. The Board also requests that the following information be included in your application for approval of your company's 2000 Capital Budget.

1) The filing requirements provide for justification of new generation or transmission projects according to one of three primary justification categories: cost reduction; reliability; or load. The Board requests that you include information on all viable alternatives or options available, in addition to the proposed project, along with the decision rationale for choosing the proposed project, for each of the justification categories.

2) Further to the requirement for information on all alternatives as described in # 1 above, it is requested that the flowchart on page 6 be amended so that Step 7 in each justification category include analysis for each alternative or corrective option being considered to support the "least cost" option choice. Please include a description of the basic cost components for each alternative considered and a description of the procedure followed to ensure that the least cost path is being followed, for example, competitive quotes for materials suppliers. Please also provide any cost benefit studies in support of the proposed project.

3) It is not clear from your report that the information provided will include the environmental costs/benefits of each alternative considered. The Board believes that this is especially important for new generation project proposals, where different alternatives may have different environmental impacts and associated costs to be incorporated over the life cycle of the project. The Board requests that you include the environmental costs and/or benefits of each alternative being considered.

It should be noted that these requirements will be applied to all new capital projects: generation and transmission, including upgrades as well as any additional projects submitted as subsequent amendments to the capital budget throughout the year.

The Board also noted that it will be reviewing the minimum filing requirements early in the new year to evaluate whether they meet the Board's requirements or require revisions.

If you require clarification and/or additional information, please contact the undersigned.

Yours truly,

G. Cheryl Blundon
Board Secretary

CB/ Hydro/mini-fil req
cc. G. Hayes, NP

Guidelines For The
Minimum Filing Requirements
For New Generation And Transmission Projects
On The Island Interconnected System

A Joint Submission To

The Board of Commissioners of Public Utilities

By

HYDRO & NEWFOUNDLAND POWER
A FORTIS COMPANY

July 22, 1998

SUMMARY

In response to the Board of Commissioners of Public Utilities (the "Board") Order P.U.17 (1997-98), Newfoundland Light & Power Co. Limited and Newfoundland and Labrador Hydro have developed this joint submission outlining the minimum filing requirements for new generation and transmission projects. These filing requirements will apply only to capital work related either to new additions or to capacity upgrades for existing plant on either the transmission or generation facilities of the Island Interconnected System.

Consensus has been reached on the minimum filing requirements for new generation and transmission projects. However, differences of opinion remain with respect to the appropriate methodology for the identification, evaluation, and justification of small generation projects. Separate submissions have been filed detailing the respective positions.

For purposes of the filing requirements, projects will be justified according to one of three primary justification categories: 1) Reliability; 2) Cost Reduction; and 3) Load. Projects may be justified using one, two or all three of these categories. However, in all cases, a primary category will be selected and all of the minimum filing requirements associated with the selected category will be provided. Justification material from the other categories will be provided only as required to adequately justify the proposed project.

The framework for the minimum filing requirements contained in this document is composed of two major information segments: common filing requirements and specific filing requirements. The common filing requirement segment will include applicable information in terms of: 1) the project name; 2) its scope; 3) its timetable and associated cash flow; and 4) any customer impacts that the project may cause. The specific filing requirements will include information related to: 1) statement of need / opportunity; 2) corrective options / alternatives; and 3) decision rationale. The minimum filing requirements will also specify the tests and guidelines used to justify the proposed project both in terms of the technical and economic / financial evaluations used.

In all cases, the minimum filing requirements will provide adequate information so that the Board will be able to make informed decisions regarding the proposed project.

TABLE OF CONTENTS

GLOSSARY OF TERMS

Firm Energy: The energy that can be relied upon to meet customer firm load requirements under the most adverse hydraulic flow condition on record.

Good Utility Practice: Practices, methods or acts (including but not limited to the practices, methods or acts engaged in and approved by a significant portion of the electric utility industry in Canada) that at a particular time, in the exercise of reasonable judgement, would be expected to accomplish the desired result in a manner which is consistent with laws and regulations and due concerns for reliability, safety, environmental protection, economy and expedition.

Load Flow Analysis: Analysis to determine the voltage, current and power at various points in an electrical network under steady-state conditions.

Rate Minimization: Objective function used in Resource Planning. The objective is to choose the expansion plan which minimizes the rates paid by customers.

Reserve Criteria: A definition setting the minimum level of reserve (capacity and energy) to be maintained on the system at all times.

Revenue Minimization: Objective function used in Resource Planning. The objective is to choose the expansion plan which has the minimum revenue requirements associated with it. If the Resource Planning does not include demand side options, this objective will automatically minimize rates as well.

Resource Planning: Analysis to determine the optimal expansion plan for an electrical system. This would include the selection of appropriate supply and demand side alternatives that give the lowest overall costs associated with a selected objective function. Two of these objective functions, Rate Minimization and Revenue Minimization, are defined above.

Short Circuit Analysis: Analysis to determine the consequences of electrical faults at various points in an electrical network.

Stability Analysis: Analysis to determine the ability of generation facilities to maintain operation under fault conditions on the electrical network.

I. INTRODUCTION

In Order P.U. 17 (1997-98), issued on January 16, 1998 (the "Order"), the Board of Commissioners of Public Utilities (the "Board") ordered that:

> *The Applicant [NP] and Hydro shall meet to consider the appropriate process and information filing requirements necessary in order for the Board to consider approval of future generation sources and transmission projects for the Province's electrical system under the Board's jurisdiction. Both the Applicant and Hydro must file their respective positions in a report no later than July 24, 1998. These reports, which may be a joint submission, must address among other things, the establishment of minimum filing requirements relating to: the identification and description of the most efficient production and transmission options available; lowest possible cost consistent with reliable service of each identified viable option considered; technical feasibility of the proposed project; the financial and economic feasibility of the proposed project; the in-service date proposed and its relationship to forecasted capacity requirements for the system; and the appropriate tests and guidelines to be followed for new generation and transmission projects.*

Newfoundland Light & Power Co. Limited (NP) and Newfoundland and Labrador Hydro (Hydro), in response to the Order, have developed this joint submission entitled 'Guidelines For The Minimum Filing Requirements For New Generation and Transmission Projects On The Island Interconnected System'. Consensus between NP and Hydro has been reached on all points discussed within this submission, with the exception of the appropriate methodology for identifying, evaluating, and justifying small generation projects. Section VIII summarizes the differences on this point.

Simply stated, the purpose of these guidelines is to ensure that the Board is presented with adequate information to permit informed decisions regarding transmission and generation capital projects.

Due to the diverse nature of the projects considered by both utilities, submissions related to project justification will vary significantly with respect to the level of detail made available. For some projects, the submission may simply be a single justification sheet consisting of one or more paragraphs, while for other projects, these minimum requirements may reference one or more comprehensive reports.

Appendix A contains a list of projects that would have fallen under the scope of these guidelines for the period 1996 to 1998. Appendix B contains a sample submission for one of these projects.

II. SCOPE

The minimum filing requirements presented in this document are limited to proposals that address capital work on the transmission or generation facilities of the Island Interconnected System, and involve only new additions or capacity upgrades for existing facilities.

III. JUSTIFICATION CATEGORIES

Capital projects submitted under the scope of these guidelines can be grouped within three primary justification categories. These three categories are:

- **Reliability**. Projects under this category are associated with either maintaining or enhancing service continuity to a customer or to a group of customers. Deferral or rejection of a proposal submitted under this justification category would primarily impact reliability of customer service. Examples of this category of proposal include:
    - The upgrade of equipment, such as modifying a transmission line to withstand increased ice loading.
    - The addition of peaking capacity to the electrical grid for emergency backup reasons.

- **Cost Reduction**. Projects under this category are those whose primary purpose is to reduce the overall cost to operate and/or maintain the power system. Deferral or rejection of a proposal submitted under this category means that the anticipated benefits would not be realized or would be realized to a lesser extent than if the project were to proceed on schedule. Consequently, delay or cancellation of such a project will normally result in financial implications such as increased customer costs. Examples of this category of proposal include:
    - The reconductoring of electrical circuit to reduce losses and thereby reduce the costs associated with these losses.
    - Voltage conversion to reduce losses and/or to eliminate the need for additional circuits in the future.
    - The automation of a generation plant to optimize plant production.

- **Load.** Projects under this category are required in order to address conditions where the operating criteria related to load, voltage, or generation (either energy or capacity) capability on the existing system will be exceeded. Deferral or rejection of a project proposal submitted under this category means that the system will either exceed its normal operating criteria or will be unable to meet all of its load requirements. Consequently, the electrical system is normally adversely affected if a project under this justification category is either delayed or cancelled. Examples of this category of proposal include:
    - The construction of an additional transmission circuit because of overloading on existing circuit(s).
    - The addition of new generation to meet capacity or energy requirements.

While many projects may fit primarily into one of the above justification categories, certain projects may fit into two or all three of the above categories. For all projects, a primary category will be chosen for the purposes of standardizing the minimum filing requirements. However, elements of the other justification categories may also be included, as required, to adequately justify the project in question.

The minimum filing requirements vary depending on the primary justification category of the project. Figure 1 shows the proposed filing framework in the form of a flow diagram depicting the common and specific information requirements for each of the justification categories introduced above.

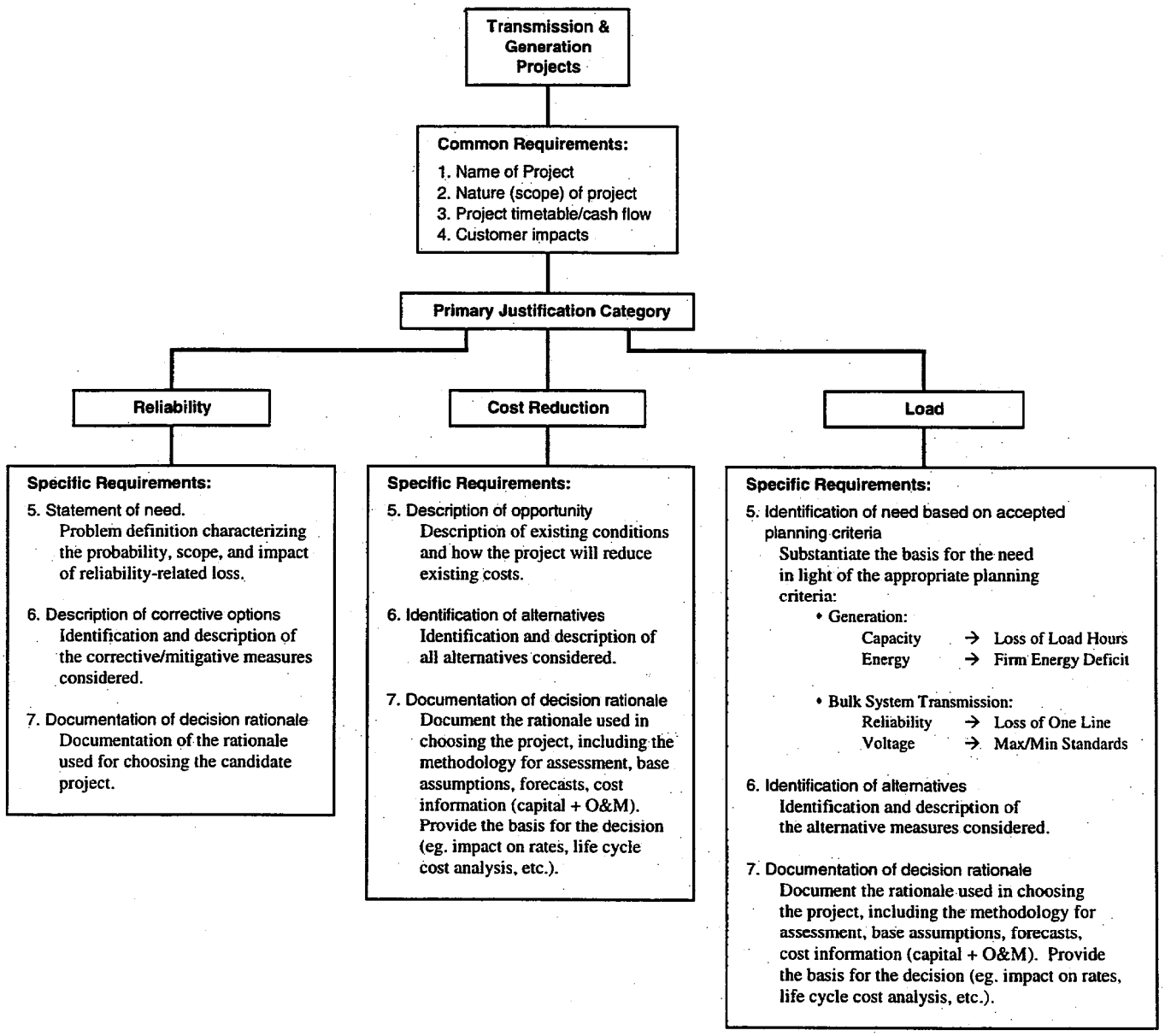

Figure 1 - Minimum Filing Requirements for Transmission and Generation Capital Projects

IV. PURPOSE OF THE GUIDELINES

In Figure 1, two segments of information are presented for each justification category, namely, a 'common' segment which will be applicable for all justification categories and a 'specific' segment which will vary depending on the justification category selected.

Basically, the 'common' segment will give the Board an overview of the project, and is intended to:

- Provide the Board with a description of what is proposed as well as the name of the project.
- Inform the Board of what the project involves, the resources that will be required, the project's timetable in terms of development, construction, and/or implementation, and the yearly expenditures associated with the project.
- Inform the Board of the primary justification category that will be used for the project.
- Provide the Board with an understanding of how the project will impact customer service and/or the cost of service.
- Inform the Board of the consequences, or potential consequences, on the customer if the project is either cancelled or delayed. Again, these consequences may be in terms of customer service, service continuity and/or the cost of service.

While this 'common' segment will be applicable to all project proposals, the level of detail provided will vary depending on the project being justified. Only information that is both relevant and of material consequence to the decision process will be provided.

The 'specific' segment can be divided into three general sections - 'statement of need / opportunity', 'corrective options / alternatives', and 'decision rationale'. Each of these sections is discussed below. For discussion purposes in this section, no distinction will be made with respect to the three primary justification categories in terms of the purpose of the 'specific' segment. Therefore, not all of the items discussed below will be

applicable to all of the justification categories. Again, only information that is both relevant and of material consequence to the decision process will be provided.

The Statement of Need / Opportunity section lays the foundation for the project's rationale. It will indicate why the project is being considered in terms of the problem or opportunity that the project will address. Basically, this section will answer the question, "Why does this project need to be done and why does it need to be done at this point in time?".

The Corrective Options / Alternatives section will identify what alternatives (if any) to the proposed project were considered. Where appropriate, detailed analysis of these alternatives will be discussed in the Decision Rationale section.

The Decision Rationale section will explain why the preferred option was chosen over any other options that were considered. It will also provide the methodology used in reaching this decision, including the criteria and assumptions utilized. Essentially, it will inform the Board of the criteria by which the projects / alternatives were ranked, selected and/or eliminated.

This framework addresses all of the issues noted in the Order. Specifically, each of the identified issues will be discussed in the indicated segment:

- '*the identification and description of the most efficient production and transmission options available*' - Common segment;
- '*lowest possible cost consistent with reliable service of each identified viable option considered*' - Decision Rationale section under the Specific segment;
- '*technical feasibility of the proposed project*' - Decision Rationale section under the Specific segment;
- '*the financial and economic feasibility of the proposed project*' - Decision Rationale section under the Specific segment;
- '*the in-service date proposed and its relationship to forecasted capacity requirements for the system*' - the date will be noted in the Common segment.

The relationship to system capacity requirements would, as necessary, be noted in the Statement of Need / Opportunity section of the Specific segment. This relationship would typically only be relevant for 'load' proposals and would therefore normally only be discussed for the Load justification category.; and

- '*the appropriate tests and guidelines to be followed for new generation and transmission projects*' - Decision Rationale section under the Specific segment. For purposes of this report these tests and guidelines are discussed in a separate section (Section VII).

V. COMMON FILING REQUIREMENTS

Filings in support of all projects will have certain elements in common regardless of the justification category or categories into which the project falls. These common items are depicted in the "Common Requirements" segment in Figure 1. Four elements are noted - the project name, its scope, its timetable / cash flow, and finally, its customer impact. Each of these will be discussed in turn.

1. Project Name

A project name, as well as a brief description of the project including the project's geographic location will be given. This information will be mandatory for all projects.

2. Project Scope

The project scope will give the details of what is proposed. It will include information such as the resources that will be required in order to complete the project, as well as the proposed time frame. Additionally, the primary justification category that will be used to justify the project will be stated here. Information with respect to the project scope will be mandatory for each project.

For projects that fit into more than one justification category, a primary category must still be selected and all of the minimum filing requirements for this selected primary category presented. While additional justification material from the other categories may also be submitted, only the information requirements for the primary justification category will be mandatory. The inclusion of additional justification material from one or both of the other categories will not require that all of the material associated with these other "secondary" categories also be included as part of the minimum filing requirements for this project. Justification from these other categories need only be supplied as deemed necessary.

3. Project Timetable / Cash Flow

Under this section, the project timetable and cash flow details will be provided, as well as for any component projects associated with the overall project. Information with respect to the project's timetable and cash flow will be mandatory, however, the level of detail may differ significantly from project to project.

The timetable will present the stages / timings associated with project development, construction and/or implementation. The level of detail will vary depending on the complexity of the project and the number of project components that need to be defined.

In terms of cash flow, project costs by year of expenditure will be presented. Again, the level of detail will vary depending on the complexity of the project and the number of project components that have to be defined.

In all cases, sufficient detail will be provided to give the Board a thorough understanding of the proposal in terms of its timetable and cash flow.

4. Customer Impact

This section will outline the impact of the project on the customer. Greater detail with respect to the impact on customers will, as required, be included in the 'Decision Rationale' section under the specific filing requirements segment for the appropriate justification category.

When applicable, customer impacts will be discussed in terms of the electrical service (*e.*g., ability to serve, reliability issues) and/or the cost of this service (*e.*g., rate impact issues). Likewise the consequences of either delaying or deferring the project in terms of customer service and/or the cost of this service may also be included.

This information will only be supplied when it is believed that it would affect the ability of the Board to assess the proposal being presented. In other words, if the customer impacts associated with a project are negligible, the impacts will not be included as part of the minimum filing.

VI. SPECIFIC FILING REQUIREMENTS

This section summarizes the specific filing requirements associated with proposals under each of the primary justification categories outlined in Figure 1, and describes the nature of the information to be included in the filing.

1. Reliability

The three basic information requirements for filing proposals submitted under the Reliability justification category are: 1) a statement of need; 2) a description of corrective options; and 3) the documentation of the decision rationale.

- **Statement of Need.** The statement of need defines the problem that the proposal is to address, and is intended to provide the Board with an insight into the anticipated consequences of maintaining the *status quo*. Typically, the statement would include a characterization of the probability of loss under *status quo* conditions, and the scope/impact of a reliability-related loss. In certain instances, it may be possible to incorporate a risk analysis to characterize the nature of the need. However, given the difficulty frequently encountered in quantifying this, it may be necessary to characterize the problem in qualitative rather than quantitative terms.

- **Description of Corrective Options.** The description of corrective options identifies and describes the various alternative measures that were considered. The description need only identify and provide a brief description of each alternative, providing an overview of the key characteristics of each alternative and any relevant advantages or disadvantages. In certain cases, it is possible that no feasible alternatives to the proposed project exist. In such cases, this will be noted in the proposal filing.

- **Documentation of Decision Rationale**. The documentation of the decision rationale provides the Board with the methodology used for assessing the various corrective options (should there be more than one), as well as the conclusions drawn from any relevant comparative analyses. Comparative analyses can include technical evaluations (*eg.*, analysis of impacts of reliability and related technical benefits), economic/financial evaluations, and other evaluations as necessary (*eg.*, safety issues).

2. Cost Reduction

Three specific information requirements apply for proposals submitted under the Cost Reduction justification category: 1) a description of opportunity; 2) an identification of alternatives; and 3) the documentation of the decision rationale.

- **Description of Opportunity**. The description of opportunity identifies and describes the conditions that currently (or eventually will) exist, and in light of such, the means by which the cost of service can be reduced. The description should indicate how the proposal addresses this opportunity.

- **Identification of Alternatives**. In certain cases it may be possible that there is more than one means by which the identified opportunity can be addressed. In such instances, a brief description of each alternative should be provided.

- **Documentation of Decision Rationale**. This section will provide the Board with the methodology used for assessing the alternatives considered, and reference any comparative analyses performed. Cost Reduction proposals inherently derive their justification from economic or financial bases - *status quo* operation remains a feasible alternative in all such cases. As a result, the submission of a Cost Reduction proposal must reduce the cost of providing service versus *status quo* operation. The documentation of the decision rationale must summarize the information required to assess the economic/financial merits of a project, the

methodology and tests used to assess the project (*eg.*, life cycle present worth analysis), and the conclusions drawn from the analysis. The documentation of decision rationale should also reference any comparative technical evaluations.

3. Load

The three specific information requirements for proposals submitted under the Load justification category are: 1) the identification of need; 2) the identification of alternatives; and 3) the documentation of the decision rationale.

- **Identification of need.** The identification of need forms the foundation of the justification for a proposal submitted under the Load justification category. Based upon generally accepted criteria, system conditions (transmission or bulk generation) are evaluated, and violations noted. Once violations are identified, appropriate remedial measures are developed. In the absence of a criteria violation, no justification exists.

  For transmission projects, criteria include the loss of a transmission element in a looped system, maximum/minimum bus voltage constraints, and equipment and plant load levels. For bulk generation projects, reserve criteria are based on the maintenance of a minimum capacity reserve level (expressed as loss of load expectation) and determination of whether firm energy deficits under firm hydrology conditions are forecast. System conditions that violate these criteria form the basis for the development of plans and projects in order to return the system to an acceptable state. The identification of need section must clearly state the criteria that has been (or will be) violated, and characterize the nature, cause, and extent of the violation.

- **Identification of Alternatives.** The identification of alternatives outlines the various alternatives developed in order to address the criteria violation,

highlighting the key information related to each alternative. Since a criteria is or will be violated, the *status quo* option is not a feasible alternative.

- **Documentation of Decision Rationale.** As with the other project proposal categories, the documentation of the decision rationale provides the Board with the necessary information to assess the merits of the proposal. As such, the documentation must summarize, among other things, the methodology, base data and assumptions used to assess the alternatives. The documentation should also reference any comparative studies used to form the basis for the justification of the proposed project, and note the instances in which no feasible/practical alternatives other than the proposed project exist. Finally, the documentation should provide a description of how and to what extent the candidate proposal addresses the identified criteria violation.

4. General

There are similarities across each of the three primary justification categories regarding the specific filing requirements. Each project must be developed in light of an identified need or opportunity, alternatives must be developed (where possible), and the decision to pursue the selected proposal is to be justified on technical and/or cost effectiveness grounds. Specific filing requirements differ across the categories to the extent that they reflect the different nature of each category. Reliability proposals tend to be more qualitative in nature, whereas Cost Reduction and Load proposals tend to be more quantitative in their justification. Cost Reduction proposals are compared against *status quo* operation, whereas *status quo* operation is not a feasible option in considering Load proposals. These differences are reflected in the nature and content of each proposal justification.

VII. TESTS AND GUIDELINES

This section summarizes the general tests and guidelines that are to be applied when filing project proposals that fall under the scope of this document. The tests will most often be embodied in the methodology used in performing the comparative studies identified in the discussion regarding specific filing requirements.

In preparing the comparative studies associated with the documentation of decision rationale (both technical and economic/financial studies) the following general tests and guidelines are to be followed:

1. Technical Evaluations

Technical evaluations provide the technical basis upon which the merits of various identified alternatives can be assessed. The technical evaluation should document the engineering data and assumptions required to perform the analysis, as well as any statements of engineering conclusions relevant to an alternative. Common technical evaluations currently carried out include load flow, short circuit, stability, and resource planning studies. At a minimum, a summary and the results of the technical evaluation should form a part of the documentation of decision rationale.

When performing technical evaluations, consideration should be given to the following general guidelines:

- all technical impacts of the various alternatives should be quantified, where possible; and
- the impacts of the various alternatives upon system operation should be addressed.

In general, the primary test for technical evaluation is that the project must satisfy the specified technical requirements, and be consistent with sound engineering design and good utility practice.

2. Economic/Financial Evaluations

Economic/financial evaluations provide the basis by which the cost effectiveness of the identified alternatives can be assessed. The most common economic/financial evaluation currently carried out is life cycle cost analysis, however, other analyses may be used where appropriate. When performing economic/financial evaluations, the following guidelines are to be followed:

- whenever applicable, projects are to be evaluated on a discounted cash flow basis;
- evaluations are to include all relevant and material costs and benefits; and
- evaluations are to provide or reference all relevant assumptions, forecasts, and costs (capital and operating).

In general, the standard test for project cost effectiveness is the lowest discounted cost of all technically viable options. However, when appropriate, other tests such as revenue minimization and rate minimization may be used.

VIII. HYDRO / NP METHODOLOGY POSITIONS

Both Hydro and NP are in agreement regarding the methodologies associated with preparing, evaluating, and justifying transmission projects. The technical and economic/financial evaluation methodologies noted above are currently performed by both utilities. However, consensus has not been reached between Hydro and NP regarding the appropriate process or methodology for developing, assessing, and justifying generation projects. The following summarizes the positions of the two utilities regarding generation projects. Both utilities have prepared separate submissions discussing their respective positions in greater depth.

Hydro: *Hydro maintains that all future supply options (utility and non utility) should be evaluated on a consistent basis using established planning methodology. Supply additions, irrespective of size, should be justified based upon the requirements of the total Island Interconnected System as identified by the application of approved planning criteria.*

NP: *NP maintains that large generation additions are warranted only when an identified need or cost saving opportunity arises, the determination of such being made possible through a rigorous resource planning process. However, NP maintains that small generation plants may be justified outside of a rigorous resource expansion plan, especially when the small generation plant can be linked to improved reliability and/or to reduced system costs. Projects of this nature may be justified based on one or more factors such as improved local reliability, the offsetting of transmission costs including avoided system losses, and/or a comparison to System Avoided Costs. In this context, NP considers small generation plants to be facilities eligible for Class 43 Capital Cost Allowance treatment*

under the Canadian Income Tax Act. Such plants are nominally 15 MW or less.

Notwithstanding the above difference, both utilities agree that all costs and benefits (including transmission and distribution impacts) associated with alternatives should be considered when evaluating the cost effectiveness of a proposal to the extent such impacts are material. Furthermore, both utilities agree that irrespective of the methodology chosen to justify small generation facilities, the guidelines noted earlier must be followed.

IX. CONCLUSION

The framework presented in this document identifies the minimum filing requirements associated with capital projects that involve new additions or capacity upgrades to facilities on the Island Interconnected System. The framework identifies three general primary justification categories (Reliability, Cost Reduction, and Load) for project proposals, and outlines the structure within which the information is to be provided in order to enable the Board to assess the merits of a proposal.

The framework identifies a common segment of information as well as a specific segment. The common segment includes the name of the project, its scope, its timetable/cash flow, and potential customer impacts. The specific segment provides the statement of need or opportunity, the description of what, if any, alternatives were considered, and the rationale by which the candidate proposal was selected.

The framework is flexible enough to allow adaptation to individual project needs while still ensuring that sufficient information is provided to the Board. The framework is thus well-suited to the evolving nature of the electric utility industry in the Province.

APPENDIX A

Project List: 1996-1998

A review of both Hydro's and NP's approved capital budgets for the years 1996 through 1998 was completed to determine which projects during this period would fall under the scope of these guidelines. These 'qualifying' projects are shown in the following table. Projects which were fully funded by individual customers are excluded.

Utility	Project Name	Primary Justification Category
Hydro	Capacitor Additions at Hardwoods and Oxen Pond	Reliability
Hydro	Upgrading of TL228	Reliability
Hydro	Upgrading Work on TL220	Reliability
Hydro	Upgrading Work on TL217	Reliability
Hydro	Upgrade TL207	Reliability
Hydro	Upgrade TL237	Reliability
Hydro	Upgrade TL203	Reliability
NP	Lockston Diversion	Cost Reduction
NP	Moose Pond Diversion	Cost Reduction
NP	Rose Blanche Brook Hydroelectric Development	Cost Reduction

APPENDIX B

Sample Submission

SAMPLE SUBMISSION

The following is a sample submission prepared in accordance with the guidelines contained in the joint submission on minimum filing requirements. The sample submission is for the "Capacitor Additions at Hardwoods and Oxen Pond", originally submitted by Hydro to the Board in 1996 as a part of its 1997 capital budget. The project was intended to increase the transmission capability on the Avalon Peninsula, however the project was subsequently delayed by Hydro due to uncertainties surrounding the Voisey's Bay Nickel load and its implications for the Avalon transmission system. Notwithstanding, the sample is provided to indicate how the submission would have been structured had the proposed guidelines been in place at the time of original submission.

I COMMON FILING REQUIREMENTS

1. Project Name

Capacitor Additions for Hardwoods and Oxen Pond

Description: This project involves all work related to the purchase and installation of additional capacitors and related equipment at the Hardwoods and Oxen Pond terminal stations such that 50 MVAR of capacitors will be installed in each terminal station. Both terminal stations are located near St. John's.

2. Project Scope

The primary justification category for this project is Reliability. In addition, however, the project offers benefits under the Cost Reduction category, as will be more fully explained under the Statement of Need.

The scope of the work is as follows:

- Upgrade the existing 14.4 MVAR capacitor bank at Hardwoods to 25 MVAR using same rating capacitor cans (*ie.* 200 kVAR, 19 kV)

- Add a second 25 MVAR capacitor bank at Hardwoods complete with definite purpose (capacitor switching) circuit breaker and associated equipment. The capacitor cans will be rated the same as the existing cans.

- Upgrade the existing 20 MVAR capacitor bank at Oxen Pond to 25 MVAR using same rating capacitor cans (*ie.* 200 kVAR, 12.7 kV). This will require confirmation that circuit breaker B5C1 has definite purpose capability.

- Add a second 25 MVAR capacitor bank at Oxen Pond complete with a definite purpose circuit breaker and associated equipment. The capacitor cans will be rated the same as the existing cans.

- Equip the existing and proposed capacitor banks with 0.5 mH switching reactors.

Included in the project cost is the purchase of spare fuse holders, insulators, and capacitor cans. The project will include costs for a switching study.

The project will be completed by a combination of contractor work and Hydro's internal forces.

3. **Project Timetable/Cash Flow**

Design work on the project will commence in January 1997, with project completion expected to be in September of 1997. Project cash flow, including escalation and IDC, is as follows:

Year	Project Cost
1997	$640,000

4. **Customer Impact**

The addition of reactive power capability to the Hardwoods and Oxen Pond terminal stations will increase the transfer capability of the eastern grid under conditions in which the Holyrood thermal plant is offline. This will improve the reliability of service to customers on the Avalon Peninsula during periods when the Holyrood thermal plant is unavailable or when single contingency outages occur. Furthermore, increasing the transfer capability of the Avalon transmission system will permit Hydro to more effectively utilize the existing Island hydroelectric facilities.

II SPECIFIC FILING REQUIREMENTS

5. Statement of Need

The current transmission system operating with no generation at the Holyrood thermal plant is capable of delivering 282 MW to the Avalon Peninsula when the Hardwoods gas turbine is off, and 310 MW when the Hardwoods gas turbine is operating as a synchronous condenser. Analysis carried out as a part of a 1995 study entitled the "East Coast Voltage Study" determined that to obtain maximum utilization of the Island's existing hydroelectric resources, it would be desirable to deliver 365 MW to the Avalon peninsula during periods when Holyrood is off. The increase in transfer capability will result in Hydro's ability to provide greater reliability of service during periods in which the Holyrood thermal plant is unavailable, or during single contingency outage conditions. If the project does not proceed, maximum transfer to the Avalon Peninsula will remain at 310 MW.

In order to increase the transfer capability to 365 MW, additional reactive power on the Avalon Peninsula is required. The proposed project permits this increase in power transfer. As a secondary benefit, the proposed project will allow Hydro to more effectively use the Island's existing hydroelectric facilities and thereby reduce the cost of service to customers. With the transfer capability limited to 310 MW without this project, there is a substantial period of time during which Holyrood must be operated at low load levels (and hence lower efficiency levels). By increasing the transfer capability to 365 MW, this period of low load level operation can be reduced by using off-Avalon hydroelectric production. The hydroelectric energy can be "replaced" at other times of the year by increasing Holyrood production during higher (more efficient) load periods. This change in dispatch will result in the same overall thermal energy production from the Holyrood facility, but lower annual fuel consumption. This will in turn reduce the fuel costs passed on to customers.

6. Description of Corrective Options

The East Coast Voltage Study concluded that the desired transfer limit of 365 MW (with no generation at Holyrood) could be obtained by providing additional voltage support to the east coast of the system. A number of alternative solutions were developed and evaluated. The two alternatives forming the basis of the final analysis were:

i) Installation of 277 MVAR of capacitors at various stations on the Avalon Peninsula; and

ii) Addition of 66 MVAR of capacitors at Hardwoods and Oxen Pond terminal stations (36 MVAR at Hardwoods and 30 MVAR at Oxen Pond) in conjunction with using unit 3 at Holyrood as a synchronous condenser.

The latter capacitor/synchronous condenser plan is the one submitted under this proposal.

7. **Documentation of Decision Rationale**

As a part of the East Coast Voltage Study, the corrective measures noted above were evaluated using standard load flow calculations. Both options were developed such that Hydro's bulk transmission criteria were maintained (see attached summary of the criteria). As a result, both options yielded technically acceptable results.

Cost estimates for the two alternatives were developed. The cost of the 'all capacitor" alternative was $3.9 million, while the cost of the combined capacitor/synchronous condenser alternative was approximately $900,000 (both costs non-discounted). The significantly greater amount of capacitors required under the "all capacitor" option accounted for the significant difference in capital cost between alternatives. Based upon capital costs the combined capacitor/synchronous condenser is the preferred option. In addition, the combined proposal offers superior technical performance due to the voltage regulating capability of synchronous condensers.

Since completion of the 1995 study, the project cash flow has been updated to reflect the latest escalation, IDC, and cost information. This is reflected in the revised project cost of $640,000.

SAMPLE SUBMISSION ATTACHMENT

NEWFOUNDLAND & LABRADOR HYDRO'S

PLANNING CRITERIA FOR THE PROVINCE'S BULK TRANSMISSION SYSTEM

Newfoundland and Labrador Hydro plans the Province's bulk transmission system to satisfy the following criteria:

- the system should be capable of sustaining the single contingency loss of any transmission element without the loss of system stability;
- in the event that a transmission element is out of service, the powerflow in all other elements of the system should be at or below normal ratings;
- the system should be able to sustain a successful single pole reclose for a line-to-ground fault provided all system generation is available; and
- all voltages are maintained between 95% and 105% for normal operations and between 90% to 110% for contingency or emergency situations.