Q. What programs does Newfoundland Power currently have in place to work in conjunction with Hydro to reduce overall cost of service and improve service reliability?

A. With regard to reducing overall cost of service, a Joint Task Force was established in 1997 by Newfoundland Power and Newfoundland and Labrador Hydro (Hydro) to explore feasible opportunities to reduce costs through the identification and elimination of duplication and through the sharing of resources.

Attachment A is a report entitled "A Report of Joint Co-ordination Between Newfoundland and Labrador Hydro and Newfoundland Power", dated December 2002. This report identifies areas where the sharing of equipment and facilities has been implemented and makes recommendations concerning additional collaborative opportunities between the two utilities.

With regard to improving service reliability, a committee was established in December 1999 by the Chief Executive Officers of Newfoundland Power and Hydro with the objective of improving service to the customers of both utilities. In general terms, the key objectives are to reduce outages arising from under frequency load shedding and to set targets, monitor performance and initiate activities to improve the System Average Frequency Index (SAIFI) and the System Average Duration Index (SAIDI) for the electrical system.

A Report of Joint Co-ordination Between Newfoundland and Labrador Hydro And Newfoundland Power

A Report of Joint Co-ordination Between Newfoundland and Labrador Hydro and Newfoundland Power

Newfoundland & Labrador Hydro
December 2002

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Introduction

The legislative mandate set out in the *Public Utilities Act* and the *Electrical Power Control Act, 1994* effectively requires that electrical utilities operating in the Province of Newfoundland and Labrador serve their customers at the lowest cost consistent with safe, reliable service. The regulated electric utilities serving the island of Newfoundland, Newfoundland & Labrador Hydro-Electric Corporation ("Hydro") and Newfoundland Power Inc. ("Newfoundland Power"), have long recognized their obligation to ensure that their respective operations are coordinated in a way that ensures that service is provided to customers at the lowest reasonable cost.

In 1997, Hydro and Newfoundland Power established a joint task force to explore feasible opportunities to reduce costs through the identification and elimination of duplication and through the sharing of resources. While this initiative determined that the areas of overlap were limited, there were several areas identified where potential exists for the sharing of resources to the benefit of customers. Progress was made, most significantly in relation to meter testing and equipment sharing, however, at that time there was no final report completed.

The issue of duplication of resources was reviewed during Hydro's 2001 General Rate Proceeding. In Order No. P.U. 7 (2002-2003), arising out of the proceeding, the Board of Commissioners of Public Utilities of Newfoundland and Labrador (the "Board") required that Hydro submit a final report, no later than December 31, 2002, on the results of joint efforts to date to reduce duplication between Hydro and Newfoundland Power. The Board directed that the report should identify and make recommendations concerning additional collaborative opportunities between the two utilities on eliminating duplication and expanding cooperation in the interests of electricity consumers.

This report has been prepared by Hydro, with input from Newfoundland Power, in accordance with the direction of the Board.

1.0 Background

The interconnected electrical system on the island of Newfoundland is comprised principally of the utility plant & equipment of Hydro and Newfoundland Power. Both utilities bear varying degrees of responsibility for the generation, transmission and distribution of electrical energy.

The respective roles of Newfoundland Power and Hydro are, however, fairly distinct. Those areas in which there is overlap, primarily at the lower voltage transmission (i.e., less than 230 kV) and distribution levels, are largely a result of the historical evolution of the electrification of the island.

1.1 Generation & Transmission Operations

The generation of electricity is the most significant cost of providing electrical service on the island of Newfoundland. Hydro and Newfoundland Power maintain a coordinated approach to ensure the most economic deployment of this largest component of the cost of electrical service.

Sources of generation on the island include both hydraulic and thermal facilities, with the bulk of generation facilities being owned and operated by Hydro. Hydro owns and operates 81% of the net island generating capacity and its generating facilities consist principally of large hydroelectric facilities, such as those at Bay d'Espoir and Cat Arm, and the large thermal generating facility at Holyrood. Newfoundland Power plays a minor role in the generation of electricity. Its 23 small hydroelectric generating facilities provide approximately 10 per cent of Newfoundland Power's total electrical energy requirements. The Newfoundland Power generation accounts for approximately 8% of total island capacity with the remaining capacity, approximately 11%, provided by two non-utility generators and Hydro's industrial customers. On average approximately 75 per cent of total generation requirements for the island are provided by hydroelectric energy, with the remainder being provided by thermal energy from the Holyrood facility.

Hydro currently owns and operates 100% of the bulk 230 kV electricity transmission grid on the island. Hydro and Newfoundland Power both own and operate transmission systems at voltages of 138 kV and 66 kV. Hydro owns approximately 65% of the 138 kV and 35% of the 66 kV Island transmission while Newfoundland Power owns 35% of the 138 kV and 65% of the 66 kV.

Responsibility for the dispatch of the various sources of generation to meet system capacity requirements rests with Hydro. Pursuant to this responsibility, Hydro requests that Newfoundland Power make some or all of its generation available when necessary. When not required by Hydro for system capacity purposes, Newfoundland Power operates its small hydroelectric facilities as efficiently as possible to provide low-cost energy to its customers.

The operators at Hydro's Energy Control Centre (ECC) and Newfoundland Power's System Control Centre (SCC) are in daily contact with respect to the coordination of various aspects of system operations. The operation of an isolated electrical system, such as the interconnected system on the Island, presents many technical challenges. To ensure that voltage and frequency levels are maintained within required limits and that interruptions in service to customers are minimized it is essential there be continuous coordination between Hydro and Newfoundland Power.

The operations groups of both utilities also have regular discussions on system operations. In many cases, the completion of capital and operating projects requires that transmission lines be taken out of service. This can impact system operations. To ensure that these circumstances are addressed in a coordinated fashion, Hydro and Newfoundland Power meet regularly to exchange information on planned work and to schedule their respective projects in a way that accommodates both utilities' schedules, improves operational efficiency and minimizes the likelihood of customer outages resulting from unforeseen events.

When widespread outages do occur, there are a number of technical challenges that must be overcome to ensure power is restored as quickly as possible. For example, when a power outage affects a large number of customers, the load must be picked up in stages to ensure the balance is maintained between the size of the load and the capacity of available generation sources. To assist in addressing these challenges, the utilities have cooperated in the development of detailed power restoration plans that provide for a coordinated approach to power restoration in specific circumstances. These plans are facilitated through ongoing communication between the respective utilities' control centres and electronic connections between their respective SCADA systems.

Both utilities have also co-ordinated with regard to high voltage transmission switching. In several areas, notably the Burin Peninsula and the southwest coast, the two utilities have availed of opportunities to share resources where cost savings can be achieved. For example, on the Burin Peninsula, where Hydro has no permanent staff resources in place, Newfoundland Power personnel have on occasion performed switching operations on Hydro's equipment, both at Hydro's request and, when in support of Newfoundland Power operations, with Hydro's permission.

1.2 Distribution Operations

The distribution of electricity is also a significant part of the total cost of providing electrical service on the island of Newfoundland. Both Hydro and Newfoundland Power provide distribution service. Newfoundland Power owns and operates distribution lines providing service to approximately 218,000 customers on the island, while Hydro operates distribution lines providing service to approximately

35,000 customers, 22,000 on the Island and 13,000 in Labrador. In a small number of areas, the electrical distribution services of the two corporations are in close proximity to each other. Generally, however, the areas where the respective utilities provide distribution services are geographically discrete.

There may be potential to achieve cost efficiencies in distribution operations in adjacent territories. Opportunities for further collaboration in distribution operations have been examined as part of the joint review process initiated in 1997. The findings of that process are reviewed in Section 2.0.

1.3 System Planning

The effective and efficient operation of an integrated electrical system requires that the utilities coordinate additions to the system. Since the 1970's Hydro and Newfoundland Power System Planning staff have met regularly to discuss the implications of load forecasts and customer growth on the need for system additions, to determine cost-effective solutions, and to ensure associated technical issues such as system protection and underfrequency load shedding are appropriately addressed. When appropriate the two companies have agreed upon the terms of reference for joint studies required to evaluate optimum transmission/distribution expansion plans for the interconnected system. Over the years there have been several joint studies completed and the mutually agreed to recommendations implemented. Studies have been completed for St. John's Area, Burin Peninsula System and the Western Avalon/ Holyrood 138 kV loop.

Most recently a study was completed that recommended an upgrade plan, involving work by both utilities, for the Little Bay Distribution System in the Springdale area. Problems associated with aged and deteriorated distribution lines necessitated a review early in 2002. One of the feeders originating at Newfoundland Power's Springdale Substation provides the energy supply to Hydro's distribution customers in the nearby Little Bay area. To address reliability concerns, the two utilities conducted a joint analysis, which resulted in the selection of the most cost-effective solution from among four identified options. The chosen option involves the reconstruction and upgrading of the lines of both utilities, and offers a lower cost solution than alternatives that would have been available to the utilities acting independently.

1.4 Other Areas of Coordination

Apart from the System Planning and Operations interaction referred to above there are two other forums for communication between Hydro and Newfoundland Power on matters affecting the Island Interconnected system:

- **Joint Utility Meetings**

The Joint Utility Meetings have been ongoing since the 1970's and are open to operations representatives from Hydro, Newfoundland Power, Corner Brook Pulp & Paper/Deer Lake Power, Abitibi Consolidated Grand Falls, Abitibi Consolidated Stephenville, North Atlantic Refining and the non-utility generators Star Lake and Rattle Brook. These meetings provide a forum for the major system stakeholders to provide an update on their operations and discuss concerns they may have. The Joint Utility Meetings are held annually and member groups take turns hosting the meeting.

- **Inter-utility System Reliability Committee**

The Chief Executive Officers of the two utilities formed the Inter-Utility System Reliability Committee in late 1999. It consists of the Vice-President of Engineering and Operations and Manager of Engineering and Energy Supply from Newfoundland Power and the Vice-President Transmission and Rural Operations and the Manager of System Operations from Hydro.

The Committee meets bi-monthly and discusses reliability issues of common concern. In particular, the reliability indices for the Bulk Electric System for Hydro and the Service Continuity for Newfoundland Power are reviewed. Also the number and impact of underfrequency events are reviewed.

The work of the Committee has resulted in a greater awareness of reliability issues. Both utilities have developed specific targets for improvement for each year that are communicated to all employees.

2.0 1997 Joint Review

In 1997 a joint committee, composed of representatives of management from both utilities and the union bargaining agents, the IBEW, was established to undertake a review of the two utilities' operations. The Committee subsequently confirmed a Terms of Reference and appointed fifteen Working Groups with representation from each utility. The Working Groups were given the mandate to review a particular area of operation and make recommendations for improvements either in, customer service/reliability, enhanced productivity or reduced costs.

The 15 areas reviewed are listed below:

1. Sharing of Specialized Equipment
2. PCB Facilities
3. Customer Enquiries (1-800 number)
4. Printing Services
5. Storage Space
6. Emergency Spill Response
7. Protective Equipment Test Facilities
8. Distribution Maintenance
9. Switching
10. VHF Mobile Radio System
11. Inventories and Common Spares
12. 138 kV Transmission Line Maintenance for Central
13. Equipment and Engineering Standards:
    1. Common Equipment and Engineering Standards
    2. 69 kV and 138 kV Transmission
    3. Substation Design Standards and Practices
    4. Line Maintenance Construction
14. Meter Shop
15. Technical Training

A summary of the findings of each Working Group is set out in this section.

Working Group # 1 - Sharing of Services and Equipment

Hydro and Newfoundland Power have always shared services and equipment. This working group reviewed the sharing of services and specialized equipment available in both utilities to determine if there were further efficiencies to be gained.

Both utilities agreed that sharing of services and specialized equipment results in the least cost, reliable electricity to the consumer and proceeded to formalize the process with a Memorandum of Understanding (MOU) for the Sharing of Services and Equipment.

The MOU on the Sharing of Services and Equipment was established in December 2000. It establishes the conditions and rates for the sharing of services, equipment and materials between the two utilities. Both utilities now have access to a broader base of services and equipment and avail of the process, when appropriate, to expedite power restoration during outages and in emergencies.

Working Group # 2 - PCB Facilities

This Committee reviewed the PCB storage, destruction, and decontamination programs within both utilities with the objective of reducing costs through the coordination of such activities.

Both utilities have an ongoing program of elimination of PCB contaminated equipment, and have been successful, with a diligent program of PCB disposal, in reducing overall inventories of PCB's to the point where, there is only one PCB storage facility for each utility.

The Committee evaluated the feasibility of one common PCB storage facility, and determined that regulatory constraints prevent the amalgamation of storage facilities. However a process was adopted by both utilities in 1997 to ensure that coordination takes place for planned decontamination and destruction of PCB material.

Since 1997 there have been four occasions where Hydro has availed of the Newfoundland Power contractor for PCB disposal.

Working Group # 3 - Customer Enquiries (1-800 Number)

This group undertook an evaluation of the 1-800 number services employed by the two utilities to determine if customer service could be enhanced through the provision of common 1-800 numbers.

This Committee determined that the continued operation of separate 1-800 numbers for billing, credit, technical and other general enquires would provide the best level of customer service.

Both utilities believe that, although there are minimum cost efficiencies available through the combining of the 1-800 emergency numbers for power interruptions and emergencies, there may be customer service improvements if there is a common emergency number throughout the province. In light of the fact that the two utilities now are using the same service provider, which was not the case in 1997, it has been determined this should be reviewed in 2003.

Working Group # 4 - Printing Services

This Committee reviewed the capacity and capabilities of the printing resources available within the two organizations to determine if efficiencies were available in the delivery of print services.

The Committee determined that Newfoundland Power has the capability to undertake some of the Hydro print services and that doing so would result in a cost reduction for Hydro print services. The two utilities have agreed to review this recommendation and, if cost savings exist, a process will be implemented, in 2003, for Newfoundland Power to complete print work for Hydro.

Working Group # 5 - Storage Space

This Committee examined the availability of excess storage space within both utilities throughout the province to determine whether opportunities existed for the practical sharing of space. They determined that there are not a significant number of locations where both utilities operate in close proximity to each other. The only locations where both utilities operate facilities and where sharing of space could be viable are St. John's, Whitbourne and Stephenville.

A review of the space available at these locations did not identify any excess space beneficial to the other utility.

Working Group # 6 - Emergency Spill Response

This Committee reviewed the emergency spill response procedures employed by both utilities to determine if opportunities existed for cost reduction through the sharing of resources (manpower, materials and equipment). It was determined during this review that the cost reduction potential was not significant. Both utilities depend on private contractors to respond to larger spills, thus ensuring that in-house storage of spill response equipment and materials are kept to a minimum.

The consensus was that an exchange of contact names, keeping each other apprised of planned spill response training and keeping an up to date listing of spill response capability would enhance timely response to spill situations.

The exchange of information between coordinators related to contact personnel and spill response materials was completed during the working group review.

Working Group # 7 - Protective Equipment Test Facilities

This Committee evaluated the present practices and facilities used to test high-voltage protective equipment to ensure worker safety at least cost. The review process included consideration of amalgamation of test facilities, as well as industry best practices for the testing of the equipment.

Two specific opportunities were revealed during the review. Newfoundland Power determined that it could reduce costs by extending the cycle for testing of rubber gloves. In addition, it was determined that Hydro had the capacity to carry out epoxy stick testing for Newfoundland Power in emergency situations. Both of these initiatives have been implemented.

It was determined there would be no advantage in amalgamating the two utilities' test facilities.

Working Group # 8 - Distribution Maintenance

This Committee reviewed rural operations where Hydro and Newfoundland Power operate adjacent to each other to determine the most effective means of operation that would enhance customer service and provide the least cost electricity to the consumer. The Committee explored ways and means of sharing resources that included consideration of the effects of reorganization of maintenance on a geographic basis.

The Committee recommended, and the two utilities agree, that having each other provide emergency service to areas where the other utility has work crews geographically closer to the work will result in improved efficiency. The process for this is established by the MOU on Sharing of Services and Equipment.

Working Group # 9 - Switching

This Committee reviewed the existing arrangements for switching to determine if operating efficiencies would be available through the co-ordination of switching between both utilities. The Committee concluded that there are efficiencies to be gained through the establishment of co-ordinated switching between the two utilities.

Co-ordinated switching has already been implemented in several areas, and Hydro has provided switching training to Newfoundland Power employees responsible for switching Hydro disconnects at Bay L'Argent, Monkstown and Doyles.

Both utilities agree that maximum operating efficiencies would be achieved through a full implementation of coordinated switching. In order to facilitate this process both utilities agree that their respective Control Centre Superintendents finalize the list of

agreed to switching locations, finalize a list of qualified switchers and agree on an implementation process.

Working Group # 10 - VHF Mobile Radio System

This Committee reviewed the infrastructure requirements to permit both utilities to talk with the other utility during switching operations and evaluated the replacement alternatives for a single system to service both utilities.

The working group determined that the only viable alternative for a single VHF system that would service the requirements of both utilities would be new infrastructure. The Committee recommended that when either utility is planning replacement of its' VHF then they would engage the other in discussions to possibly replace both with a common system.

Hydro is currently proposing the replacement of its VHF radio system beginning in 2004. Hydro and Newfoundland Power have met to discuss Hydro's planned VHF system replacement. A consultant has determined that the additional initial capital cost of adding Newfoundland Power to Hydro's system would be in the order of $3,000,000. However, Newfoundland Power has determined that it would not be cost-effective to participate in the development of a joint system as it is not planning a replacement of its VHF system at this time.

Hydro intends to seek approval in 2003 for the replacement of its system commencing in 2004. Newfoundland Power has agreed to provide Hydro with input to ensure the design of the new system does not unnecessarily or unreasonably preclude the possibility of Newfoundland Power utilizing the system in future.

Working Group # 11 - Inventories and Common Spares

This Committee reviewed materials management practices at both utilities to identify opportunities for sharing of inventories, cost reductions through standardization and potential benefits/constraints to shared warehouse facilities where practical.

Hydro and Newfoundland Power have a long history of sharing of inventory materials, whenever one utility has an immediate need that the other can meet. Both utilities maintain dedicated safety stock of critical items.

The process for the sharing of inventory materials has been included in the MOU for Sharing of Services and Equipment.

The Committee concluded that any savings realized through the combination of warehouse facilities in Whitbourne, Stephenville or Grand Falls/Bishops Falls would be off set by a corresponding increase in travel costs for the crews to pick-up materials.

Both utilities believe that inventory reductions may be achieved and material availability improved through further standardization of distribution and transmission line hardware, and will direct the appropriate personnel to review differences in standards in 2003 to identify any additional areas where standardization is feasible.

Working Group # 12 - 138 kV Transmission Line Maintenance for Central

This Committee undertook a review of the maintenance of 138 kV transmission lines in central Newfoundland to ensure that maximum reliability was being achieved and that there was minimum duplication of services. The Committee explored ways and means of sharing resources that included consideration of the effects of reorganization of maintenance responsibilities.

While the utilities were able to agree on the sharing of resources and materials as outlined in the MOU on Sharing of Services and Equipment, they could not reach consensus during the joint review on the issue of realignment of maintenance responsibilities.

Working Group #13 - Common Equipment and Engineering Standards

This initiative consisted of a review by four independent working groups who evaluated material and equipment specifications, design standards, construction standards and work methods for both utilities.

The mandate for these committees was to identify any potential cost reduction opportunities that may be derived from standardization.

The working group reviewing the Distribution line standards has achieved standardization in the areas where it is practical and appropriate. Some differences remain and both utilities agree that their respective engineering design groups will meet in 2003 to implement further standardization.

The working group, which reviewed the 69kv and 138 kV transmission line standards, developed a Wind and Ice Loading map for the entire system. This group reviewed the differences in design criteria for transmission line hardware and did not identify any significant opportunities for common design criteria. The primary reason for this lies in the different requirements for the bulk electrical system of Hydro and the distribution system of Newfoundland Power.

The concept of standard design for sub-station foundations and structures was evaluated. However, because of significant variances in conditions from site to site, specific design is often required.

Working Group # 14 - Joint Meter Shop Review

This Committee reviewed the meter shop operations of both utilities with the objective of reducing costs to the ultimate customer through the coordination of such activities.

In 1999, Newfoundland Power determined that the least cost approach for it was to contract out its meter testing and calibration. Hydro has acquired Measurement Canada Accreditation for its meter shop, which permits it to test, calibrate and seal meters.

Hydro presently has the 2002 contract for the servicing of Newfoundland Power meters and Newfoundland Power will be renewing the contract with Hydro for 2003.

Working Group # 15 - Technical Training

This working group explored opportunities for cooperation in the design, purchase and/or delivery of technical training programs that meet the strategic business needs and employee development priorities of both utilities.

While it was determined that the opportunities were limited, and the potential savings difficult to quantify, both utilities agree that this issue should be further explored in 2003.

3.0 Observations and Conclusions

A certain level of duplication of resources is inherent in an industry structure involving two separate corporations. Barring legislative change, some continuing degree of duplication is inevitable. In August 1998, the Government announced the Energy Policy Review, which included a review of the structure of the electrical industry in this Province. Until such time as the Energy Policy Review is finalized, further discussions between the utilities on such matters as service areas, or transfers of ownership of significant assets, are premature.

In terms of impact on operational effectiveness, the most significant opportunities for cooperation between Hydro and Newfoundland Power are at the generation and transmission level. For the most part, these opportunities are being realized on an ongoing basis. In other areas, as well, Hydro and Newfoundland Power cooperate on an ongoing basis to ensure the effective and efficient operation of the Island Interconnected electrical system.

The utilities have established a number of processes to address specific issues. These include system planning meetings that are generally held three times a year; annual joint utility meetings that provide a forum for major system stakeholders to discuss their concerns; the Inter-Utility System Reliability Committee, which meets bi-monthly to discuss reliability issues of common concern; and operations group meetings to discuss planned outages and coordinate maintenance and construction activities. These processes are described in Section 1 of this report.

Increasing attention has been given in recent years to identifying opportunities to reduce cost and improve service through collaboration at the distribution level. While some progress has been made along these lines, the degree of geographic separation of service territories will present a practical limit on achieving savings.

The areas evaluated during the 1997 review process did not result in the identification of significant savings in any area that could be achieved by enhanced coordination. The minor opportunities identified have been implemented or will be refined in 2003.The following areas have been identified for further review during 2003:

1. Explore the benefits of a common 1-800 number, for reporting power interruptions and emergencies, in light of both utilities now having a common service provider;

2. Review the print services recommendation to confirm the available savings and implement a process for Newfoundland Power to provide Hydro print services;

3. Develop and implement a formalized coordinated switching plan;

4. Review Hydro's proposed VHF Radio System replacement for possible provision for future expansion to accommodate Newfoundland Power requirements.

5. Review the Distribution and Transmission Line hardware standards to identify any additional areas where standardization is feasible; and

6. Explore additional opportunities for joint training programs.