SECTION C

NEWFOUNDLAND & LABRADOR HYDRO
TRANSMISSION & RURAL OPERATIONS
2004 CAPITAL BUDGET
PROJECTS SUBJECT TO MINIMUM FILING REQUIREMENTS - OVERVIEW
($,000)

PROJECT DESCRIPTION	Exp To 2003	2004	Future Years	Total	In-Ser Date	Explanation Page Ref.
Purchase and Install Transformer Addition - Happy Valley Terminal Station	7	1,244		1,251	Nov. 04	C-2
TOTAL TRANSMISSION & RURAL OPERATIONS	**7**	**1,244**	**0**	**1,251**		

Purchase and Install Transformer – Happy Valley Terminal Station

1. Project Description

This project includes all work involved with the purchase and installation of a 30/40/50 MVA 138/25kV transformer and associated terminal station equipment to replace one of the existing 15/20/25/28 MVA units

2. Project Scope

This project is being justified on the basis that additional transformer capacity will be required to meet the anticipated load requirements in Happy Valley – Goose Bay.

The scope of work is as follows:

- Replace one of the existing 138/25kV 15/20/25/28 MVA transformers with a 30/40/50 MVA unit.
- Install a new 25kV circuit breaker and two 1200 amp disconnect switches
- Upgrade 25kV bus conductor from 559.5 mcm to 1192.5 mcm

The new equipment will be installed on the existing foundations and structures and no foundation modifications are expected to be required. The existing circuit breaker's current transformers (C.T.'s) are rated at 600 amps which is not adequate for the increased transformer capacity resulting in the requirement for the new breaker. Likewise the existing 25kV bus conductor cannot carry the additional capacity resulting in the requirement for the bus conductor upgrade.

3. Project Timetable/Cash Flow

The preliminary design and engineering work will commence in the late fall of 2003 with the actual installation taking place in the fall of 2004.

Project Cost: *($ x1,000)*	**2003**	**2004**	**Total**
Material Supply	0.0	875.0	875.0
Labour	0.0	54.0	54.0
Engineering	7.0	32.0	7.0
Project Management	0.0	8.0	8.0
Inspection & Commissioning	0.0	35.0	35.0
Corp O/H, AFUDC, Esc. & Contingency	0.4	240.2	40.6
Total	**7.4**	**1,244.2**	**1,251.6**

Purchase and Install Transformer – Happy Valley Terminal Station (cont'd.)

4. Customer Impact

If additional transformer capacity is not added at Happy Valley - Goose Bay the existing transformers will be approximately 4% overloaded during the 2004 peak load period. Continued operation in an overloaded state will result in loss of transformer life and premature failure resulting in an outage to customers.

5. Statement of Need

At present there are two 15/20/25/28 MVA transformers at the Happy Valley Terminal Station for an installed capacity of 56 MVA. Based on Hydro's December 2002 load forecast these units will be slightly overloaded during the 2003 peak and by 2004 the overload at time of peak will be approximately 4%. Hydro's criteria for its major power transformers, which is consistent with industry standard, is to add capacity when projected load exceeds the transformer installed nameplate rating, which in the case of Happy Valley is 56 MVA. The projected load for the period 2003 – 2007 and the resultant % station loadings are shown below:

YEAR	MVA LOAD	%STATION LOAD
2003	56.9	101.6
2004	58.3	104.1
2005	60.0	107.1
2006	61.2	109.3
2007	62.6	111.8

6. Description of Corrective Options

The alternatives investigated for Happy Valley were to change out one of the existing transformers for a larger unit or to add a third transformer of equal rating to the existing units. The transformer change out, as being proposed, has a cost of $1.25 million while the addition of a third unit would cost approximately $ 2.4 million where the additional cost is attributed to the station expansion required to accommodate a third transformer.

Purchase and Install Transformer – Happy Valley Terminal Station (cont'd.)

7. Documentation of Decision Rational

Based on the forecasted load growth in Happy Valley- Goose Bay it is essential that additional transformer capacity be added by 2004 if the capability of the system is to be maintained. Of the alternatives investigated, it is recommended that the lower cost alternative of the transformer change out be implemented. While the addition of the third unit does offer minor improvements in operating flexibility it is believed that the additional expenditure is not warranted. It is proposed that the unit being removed from service be maintained as a system spare that will be kept at Happy Valley but made available to other areas on the system if required. Demand Side Management was investigated as an option to mitigate the load increase but it was determined the project could not be deferred through the application of this measure (see analysis on next page).

Demand Side Management Analysis for Capital Budget Proposal

Project Title: Happy Valley Goose Bay - Transformer Replacement
Description: Replace 15/20/25 MVA transformer with 30/40/50 MVA

Overview: NLH views DSM as an opportunity to defer or postpone capital costs. The evaluated in economic terms as the difference in the present value of the utility revenue varying commencement years for the investment. The difference represents a DSM budget is the maximum amount of money that can be expended in order to defer the investment. The proceeds by determing the necessary demand or energy savings required to defer the investment evaluates whether the DSM budget constraint can achieve the required saving. This DSM review a preliminary screening to ensure there are no obvious DSM opportunities

The most economic peak demand DSM option, namely, domestic hot water (DWH) load evaluated against the required demand savings with the calculated DSM

Conclusion
The DSM deferral budget does not provide sufficient funds to achieve the load deferral targets. DS viable alternative in this circumstance. The salient details of the DSM review follow

	2004	2005	2006	2007	2008
Load Forecast (HR OPLF Dec					
Peak Demand Forecast	58,271	59,712	61,161	62,618	na
Domestic	3,660	3,765	3,876	3,975	na
Existing Transformer	56,000 kva, unit power				
Capital Budget	$1,251,60				

	1 Yr	2 Yr	3 Yr	4 Yr	5 Yr
Required Demand Savings for Capital Deferral	2,271	3,712	5,161	6,618	na
DSM Budget Calculation (Calculated assuming 2% inflation and 7.2% rate base return as per					
Capital Budget Deferral	4.9%	9.5%	13.9%	18.0%	22.0%
Total DSM Deferral	$57,209	$110,916	$162,288	$210,157	$256,85
DSM Budget Per Required Demand Savings	$25	$30	$31	$32	na

* Percentage of capital cost that can be incurred to defer project for 1 to 5 years, and still be indifferent in economic terms.

DSM Supply Cost - $ per kW	$/kW*
Cooking Range Fuel	$1,331
Domestic Hot Water (DHW) Fuel	$1,327
Compact Fluorescent Lighting	$362
Domestic Hot Water (DHW) Load	$354

* includes provision for distribution losses.

Maximum Achievable Winter Peak Demand (Max kW reduction at lowest DSM supply cost and full DSM deferral budget)	1 Yr	2 Yr	3 Yr	4 Yr	5 Yr
DHW Load	162	314	459	594	na
Achievable DSM Less Required DSM	(2,109)	(3,398)	(4,702)	(6,024)	na