Q. SUBSTATIONS

PUB 39.0

B-12 Replacement and Standby Substation Equipment

Please compare, including an explanation for any fluctuations that exceed 10% year over year, the budgetary allowance of $1,023,000 for standby substation equipment with the allowance for the same item (standby substation equipment) in previous years' budgets.

A. *General*

As noted in report *2.2 2006 Replacement and Standby Substation Equipment*, the budgetary allowance of $1,023,000 is comprised of projected expenditures of $660,000 for the purchase of standby substation equipment and $363,000 for emergency replacements. The estimates of the expenditure requirements for these two budget items are based primarily on an assessment of historical actual expenditures for similar items.

Newfoundland Power's capital expenditures requirements for standby substation equipment and emergency replacements depend on the incidence of actual or imminent equipment failures. When equipment is withdrawn from the standby pool to replace failed or failing equipment, the pool must be replenished, necessitating expenditures for Standby Equipment. At the same time, the labour associated with the replacement of the failed equipment, and the acquisition of any non-stock items, will be charged to Emergency Replacements.

Large portions of Newfoundland Power's substation assets in service are approaching the end of their expected service lives. These assets are experiencing physical deterioration due to such causes as corrosion, exposure to the sun's ultraviolet radiation, and damage due to power surges. In recent years, the effects of age on these assets have resulted in a marked increase in unplanned replacements of major substation equipment.

While failures of substation equipment are inevitable, the incidence of failures in any one year cannot be predicted with any degree of accuracy. Given the unpredictable nature of such expenditure requirements, the Company's engineers must estimate future requirements using historical expenditures and recent experience as a guide.

Further complicating the budgeting process is the variety of substation equipment. The equipment for which standby units are required ranges from smaller items, such as potential transformers (PTs) costing between $1,000 and $10,000, to larger items, such as circuit breakers that can range from $30,000 to $100,000 in price.

Variances in failure experience can significantly alter expenditure requirements from one year to the next. For example, the Company acquired 2 circuit breakers for its standby pool in 2004 at a total cost of $85,000; while in 2002, a total of 4 circuit breakers were acquired at a cost of $284,000. In 2002, the Company acquired 3 PTs at a cost of

approximately $14,000; while in 2004, a total of 9 PTs were acquired at a cost of approximately $42,000.

Budget vs. Actual Expenditures
Table 1 shows budget amounts and actual capital expenditures comparable to the budgetary allowance of $1,023,000 for the Standby Equipment and Emergency Replacements components of the 2006 Replacement and Standby Substation Equipment project.

Table 1
Replacement and Standby
Substation Equipment
2002 to 2006

	Standby Equipment		Emergency Replacement	
Year	**Budget**	**Actual**	**Budget**	**Actual [1]**
2002	443,000	577,000	0	262,000
2003	350,000	415,000	0	166,000
2004	600,000	680,000	0	286,000
2005	600,000 [2]	650,000(F)	250,000 [2]	370,000(F)
2006	660,000	-	363,000	-

1. Actual expenditures for Emergency Replacements for 2002, 2003 and 2004, based on a detailed review of capital work orders.
2. For purposes of this analysis, the $850,000 budgetary allowance for Corporate Spares & Replacements in the Replacement & Standby Substation Equipment project in Newfoundland Power's 2005 Capital Budget has been segmented into its two components.

Variances from budget in this expenditure category are expected to continue, since accurate forecasting is difficult. To explain year over year budget variances to date, it is appropriate that Emergency Replacements and Standby Equipment be considered separately.

Emergency Replacements
The report *2.2 2006 Replacement and Standby Substation Equipment* provides details of the budgeted expenditures included in the Emergency Replacements category.

Prior to the 2005 capital budget, Emergency Replacements were not specifically budgeted in the Replacement and Standby Substation Equipment project. For the most part, the capital expenditures for emergency substation equipment replacements were charged to the Replacement and Standby Substation Equipment project. Depending on the nature of the work, however, certain of the expenditures would have been charged to other Substations projects, such as Rebuild Substations.

In preparing the 2005 budget, it was recognized that these emergency replacement expenditures had reached a material level and, to improve budgeting and cost control, should be budgeted separately. Based on historical expenditures and the judgment of

engineering staff, an allowance for emergency replacements of $250,000 was included in the budget for Corporate Spares & Replacements in the 2005 Replacement and Standby Substation Equipment project.

The 2006 budget figure, an approximately 45% increase over the 2005 budget amount, was set in light of actual 2004 expenditures of approximately $286,000 and a forecast expenditure for 2005 of approximately $370,000.

Standby Equipment
The report *2.2 2006 Replacement and Standby Substation Equipment* provides details of the budgeted expenditures included in the Standby Equipment category.

As noted in *General*, the relatively steady increase in substation equipment failures has also influenced Standby Equipment expenditures, which are required to replenish the pool of replacement equipment. While a number of failures can be attributed to storm damage, particularly lightning, most failures of substation equipment are age-related. As can be seen in Table 1, budgeted expenditures in this category have shown an upward trend in recent years, although there was a slight decrease in 2003.

The 2003 budget for Standby Equipment was reduced from the 2002 budget by 28% due to the Company's expectation, at the time the 2003 budget was prepared, that actual requirements for 2003 would be more reflective of the years prior to 2002. Actual expenditures for 2000 and 2001 were approximately $175,000 and $232,000, respectively.

Actual 2002 expenditure requirements were significantly higher than the budget allowance. Together with a forecast variance over the 2003 budget at the time the 2004 budget was being prepared, this influenced the decision to increase the allowance for Standby Equipment for 2004 by 71% as compared to 2003.

At the time the 2005 budget was prepared, the forecast expenditure for 2004 was not materially different than the budget. Consequently, the budget for Standby Equipment was maintained at $600,000 for 2005.

By the time the 2006 capital budget preparations were underway, actual 2004 expenditures were known to have exceeded the budget, and 2005 expenditures were forecast to exceed the 2005 budget as well. In light of these developments, the 2006 budget for Standby Equipment was increased by 10% over the 2005 budget amount.

Concluding
Capital expenditure requirements associated with the unplanned replacement of failed or failing substation assets have been increasing in recent years. Due to the age of substation assets in service, failures are expected to continue to put upward pressure on capital expenditure requirements. Because equipment failures tend to be unpredictable, budgeting appropriate capital expenditure allowances for emergency replacements is

difficult. Consequently, it is expected that variances from budget will continue to occur until the Company's experience of substation equipment failure becomes more stable.