Q. Before embarking upon a replacement penstock, would not Newfoundland Power Inc. consider it financially prudent to seek expertise from an established woodstave pipe engineering and supply firm to evaluate the Rattling Brook penstock in order to determine whether the existing penstock may be refurbished to extend its life? (Please see attached paper from the Summer 2002 edition of the Canadian Dam Association Bulletin entitled, "Life Extension of a Wood Stave Penstock at Nipissing Generating Station of Ontario Power Generation Inc."

A. SGE Acres were contracted in 2003 to evaluate the condition of the existing penstock and recommend a course of action. Based on the recommendations of the SGE Acres engineers and the judgment of Newfoundland Power's engineers, it was determined that the woodstave penstock at Rattling Brook was not a candidate for life extension due to the advanced level of deterioration.

Crushed woodstaves are the main source of leakage in deteriorated woodstave penstocks, as the crushed wood has little structural integrity. When such crushing is prevalent, the deteriorated wood is the principal source of leaks following de-watering.

The referenced paper, at page 9, states as follows:

> "…once stave crushing has started, it will compound as efforts are made to tighten up on the banding to reduce leaks, leading to further crushing. Unless something is done, this is the beginning of the end for the penstock."

Crushing and delamination of the wood staves along the entire length of the Rattling Brook penstock has been noted since the mid 1990s. Since then, the penstock has continued to deteriorate. The extent of penstock deterioration at Rattling Brook is normal for a penstock of its length and diameter which is exposed to such water pressure levels.

The penstock at Nipissing is much shorter and experiences lower water pressures than the penstock at Rattling Brook. There are many variables involved in the life and operation of a penstock. What may work at one location may not work at another. For this reason, it is difficult to draw parallels between the two.

The life extension of the Nipissing penstock in 2001 was projected to add 15 years to the operating life of the penstock. Newfoundland Power understands that the owner of the Nipissing hydroelectric facility is proceeding with plans to replace the lower 120 metres of the 630-metre penstock due to continued deterioration and operational problems.

Based on the results of the 2003 assessment inspection, a life extension of the Rattling Brook penstock is not feasible. The only viable option for the Rattling Brook penstock is replacement.