With the establishment of fiber optic networking to carry voice data protection signals (sic) between substations and the system control center in St. John's, it was stated in the project justification that this project is justified on the basis of power system reliability improvements – supporting faster clearing of system faults and minimizing fault impact on the power system.

Q. Please provide statistics to show that this has indeed been the case.

A. The primary purpose of the installation of fibre optic links between the various substations in the St. John's area was the transmission of electrical system protection signals associated with fault clearing on the St. John's transmission line system. The transmission of voice and data signals was a secondary benefit that availed of the capacity of the fibre links to carry additional information.

Following a number of widespread power outages affecting the island-wide electrical system, Newfoundland Power and Newfoundland & Labrador Hydro agreed that it was necessary to improve clearing times for faults on transmission lines in the St. John's area. It was determined that transmission line faults should be cleared from the electrical system within 10 cycles (0.1667 seconds) of detection to avoid impacting the stability of the provincial electrical system and damaging generating equipment.

Table 1 below lists the most recent instances of detected transmission line faults in the St. John's area.

Table 1
Examples of Transmission Line Fault Clearing Times

Date	Line	Type of Fault	Clearing Time
September 19, 2001	13L (SLA - SJM)	Phase-to-phase	62 cycles (1.03 seconds)
March 22, 2002	72L (HWD - GOU)	Phase-to-phase	4.0 cycles (66.7 milliseconds)
November 3, 2001	72L (HWD - GOU)	Phase-to-phase	4.3 cycles (71.7 milliseconds)
July 4, 2001	31L (OXP - SLA)	Line-to-ground	4.6 cycles (76.7 milliseconds)
February 17, 1999	58L (OXP - VIR)	Phase-to-phase	5.0 cycles (83.3 milliseconds)

The first entry in Table 1 represents a fault on transmission line 13L that occurred prior to the completion of the protection upgrade on that line. This was the most recent instance of a slow clearing fault resulting in a major system disturbance. The associated outage interrupted the supply of electricity to 107,552 customers on the Avalon Peninsula for periods ranging from 26 to 44 minutes.

The final four entries in Table 1 show clearing times for faults that occurred following the completion of the protection upgrades and the installation of the associated fibre optic links. Since the completion of the installation of the protection upgrades and fibre optic links, there have been no significant outages on the provincial electrical system caused by a fault on any of the St. John's transmission lines included in the upgrade project.