Q. Outline S. Barreca's experience in the design and operation of telecommunication systems for a Canadian electrical utility whose primary role is bulk grid owner and operator.

A. This response also addresses NLH-2 and NLH-3.

Mr. Barreca has extensive experience covering various aspects of Hydro's proposed 2004 Budget submission. He has general experience specifically in the areas of capital budgets, telecommunications, utility rate-base and price-cap regulation, engineering economics, and discounted cash flow modeling. Additionally, Mr. Barreca has performed valuations of electric utilities. Like the members of the Board, or any single individual for that matter, Mr. Barreca is not a subject matter expert in all of the various disciplines inherent in the numerous budget projects. For instance, the Hydro budget includes, but is not limited to, issues involving the following disciplines:

- Asynchronous DS-x telecommunications protocol, networking and equipment.
- Synchronous Optical Networks (SONET OC-3) protocols, networking, and equipment.
- Microwave Transmission Systems
    - Narrowband & Broadband Asynchronous Systems
    - Synchronous Broadband microwave systems
- Satellite Transmission Systems
- Wireless Voice/Data Networks – Design & Operation
- Power Line Carrier Systems
    - Analog PLC
    - Digital PLC
    - Broadband PLC (Digital & Analog)
- Power System Teleprotection – Design and Operation

- Power System Supervisory, Control and Administration (SCADA)
- Power Transmission Systems – Design and Operation
- Power Distribution Systems – Design and Operation
- Power Generation – Design and Operations
- Telecommunication Carrier Systems
    - Public Switched Telecommunication Networks – Design & Operations
    - Cellular Networks – Design & Operation
    - PCS Networks – Design & Operation
    - Fiber Optic Networks
    - Network Reliability, Protection and Redundancy
    - Traffic Managements
    - Circuit Switching Systems
    - Packet Switching Systems
    - Digital Carrier Systems
- Engineering Economic Modeling
- Large Utility Capital Budgeting
- Discounted Cash Flow Modeling
- Computer Systems Design, Operation, Depreciation and Life-Cycles
    - End User Hardware/Software
    - PC Technology
    - Thin-Client Technology
    - Peripheral Devices
- Computer Networking Design, Operation, Depreciation and Life-Cycles
    - Server Technology
    - Centralize Storage Technology (e.g. SANs)
    - Virtual Private Networking
    - LAN & WAN Networking

It is safe to assume that no single individual could amass experience in each of the disciplines listed in a single lifetime sufficient to allow such individual to be qualified to give expert evidence in respect of all of those disciplines. Nor should that be necessary in order to evaluate Hydro's budget proposal. The budget proposal should be documented and presented in such a manner such that experts with similar experience to Mr. Barreca, the Board, as well as others with less experience can evaluate its economic prudence.

Mr. Barreca has sufficient knowledge to be able to fairly evaluate a properly documented capital budget for an electric utility. Mr. Barreca does not, however, have extensive firsthand experience in the

1. *"design and operation of telecommunications systems for a Canadian electrical utility whose primary role is bulk grid owner and operator", and*
2. *"design and operation of any power system teleprotection systems", and*
3. *"design and operation of power line carrier technology in the high voltage class – 230kV."*