

1 Q. With respect to the replacement of manufacturer non-supported equipment,
2 answer the following questions or provide the information appropriate on
3 each budget item identified below:
4

5	Budget Item	Amount	Description
6	B-8	\$863,000	Replace Exciter Unit 1 – Cat Arm (installed
7			1984)
8			
9	B-11	\$606,000	Replacement of Governor Control – Upper
10			Salmon (installed 1982)
11	B-13	\$153,000	Upgrade Controls on Spherical Valve#5 – Bay
12			d’Espoir
13	B-65	\$2,379,000	Replace Power Line Carrier Equipment –
14			Transmission System – West Coast.
15	B-66	\$8,373,000	Replace VHF Mobile Radio System (installed
16			1989 – not supported by mfg. since 1991).
17	B-67	\$58,000	Replace Tele-protection – Stony Brook – Grand
18			Falls Frequency Converter.
19	B-68	\$556,000	Replace UHF Radio – Upper Salmon (20 years
20			old)
21	B-70	\$311,000	Replace Remote Terminal Unit for Hydro –
22			Phase 3
	B-73	\$52,000	Replace Telephone Isolation Equipment –
			Sunnyside & Western Avalon

Total \$13,351,000

- 23 (a) Provide failure statistics for the equipment over the past 5 years.
24 (b) What spares were purchased initially for this equipment?

- 1 (c) What spares were purchased as Hydro became aware that spares were no
2 longer going to be supplied by the Manufacturer?
- 3 (d) Provide details on the spare parts currently in inventory.
- 4 (e) What is Hydro's practice with respect to spares on equipment once that
5 equipment is no longer supported by the manufacturer?
- 6 (f) As one system, or part of a system is retired, can the parts from that system
7 be used as spares and otherwise to support extending the life of another
8 system for another number of years? Provide details of situations where this
9 approach has been utilized in the past.
- 10 (g) What are the benefits and costs of training an employee or contracting
11 others to maintain a supply of spares through replacement of components
12 and rebuilding boards given the capital costs associated with the
13 replacement of equipment for such purposes in 2001 and 2002?
- 14 (h) Given the substantial costs of replacing such equipment for lack of spares,
15 has Hydro changed its practices with respect to purchasing spares, both in
16 the initial purchase and as manufacturers remove support for such
17 equipment?

- 1 A. B-8 – Replace Exciter Unit 1 – Cat Arm (installed 1984)
- 2 a) There has been 2 forced outages requiring one card to be
- 3 replaced during the period 1996 - 2001. Some card
- 4 components were replaced in 1999 at the recommendation of
- 5 the manufacturer.
- 6 (b) All spares recommended by the manufacturer were purchased with
- 7 the initial purchase of the excitation system.
- 8 (c) Considering the cost of spares and spares available in Hydro's
- 9 inventory, Hydro decided not to purchase additional spares when the
- 10 manufacturer gave notice that the equipment would no longer be
- 11 supported.

12 (d) The Cat Arm exciter spare parts list as of 2001/07/11 is:

13	Part # Description	Available
14	58602818 Breaker, ABB M611 FAN 0.25-0.4A	1
15	58602819 Breaker, ABB M611 FAN 1.6-2.5A	1
16	58602794 Card, ABB Voltage Relay UNS00106-P	2
17	58602796 Card, ABB Supply KX9170A	2
18	58602854 Contact, Main 1500A, 600V	1
19	58602857 Switch Air Flow	2
20	58602815 Thyristor ABBC5411-20	3
21	58602808 Card, ABB UN0016A-P	1
22	58602795 Card, ABB UN0026A-P	1
23	58602807 Card, ABB UN0027A-P	1
24	58602799 Card, ABB UN0031A-P	1
25	58602791 Card, ABB UN004A-P	1
26	58602810 Card, ABB UN0079A-P	1
27	58602812 Card, ABB UN0083A-P	2
28	58602798 Card, ABB UN0089A-P	1
29	58602813 Card, ABB UN0091A-P	1

1	58602814 Card, ABB UN0093A-P	1
2	58602801 Card, ABB UN0503A-P	1
3	58602821 Coil, ABB NEF 73220	2
4	58602822 Coil, ABB NEF 75420	1
5	58602824 Coil, ABB NEF 77875	1
6	58602802 Card, ABB UN0901B-P	1
7	58602806 Card, ABB UN1001C-P	1
8	58602792 Card, ABB UN1004A-P	1
9	58602804 Card, ABB UN1004A-P	1
10	58602805 Card, ABB UN1024C-P	1
11	58602803 Card, ABB UN2010B-P	1
12	58602820 Card, ABB 1WX 174-2	1
13	58602797 Card, ABB UN0077A-P	1
14	58601573 Card, ABB UN2001F-P	2

15

16 These spare parts are used for both exciters at Cat Arm (Units 1 & 2).
17 There is no spare conduction-monitoring card (Part # 58602811, Card,
18 ABB UN0025A-P) available in inventory. This spare card was used
19 during a failure on 2001-06-15.

20 (e) Hydro's practice is to check with other utilities using similar equipment
21 in an attempt to obtain spares. Also, contact is made with other
22 manufacturers for supply and repair of the failed electronic cards.

23 (f) Yes, when a system is retired, its parts can be used as spares for
24 other identical systems in service in the overall Hydro system. For
25 example, when an exciter of a generator is replaced, its parts are used
26 as spares for identical exciters for a limited period only to maintain
27 equipment compatibility and maintenance/ technical support. This
28 approach was used at Bay d'Espoir during the replacement of the
29 exciters on Units 1 – 6. The first exciter was replaced in 1995 and the

1 last one in 1999. A similar approach is also being used at Holyrood
2 where electrohydraulic controls for Unit 2 were replaced in 1999 and
3 Unit 1 control replacement is planned for 2003. In the meantime,
4 parts from Unit 2 are kept as spares for Unit 1.

5 (g) In most cases original manufacturers do not provide detailed drawings
6 for the electronic cards, as these are considered proprietary. Also,
7 considering that Hydro has only a limited number of such systems in
8 service it is not practical to train an employee to the level required for
9 troubleshooting and repair of these complex electronic cards. In the
10 industry, card repairs are usually performed by the original
11 manufacturers who have the detailed drawings and level of expertise
12 required for such repairs. Due to the lack of detailed drawings no
13 other manufacturer can perform and guarantee the repairs of these
14 electronic cards.

15 (h) When purchasing equipment, Hydro requests a list of recommended
16 spare parts from the manufacturer. The recommendations are
17 reviewed and an appropriate quantity of spare parts is purchased.
18 When Hydro becomes aware that equipment is about to become
19 obsolete (when we become aware that a manufacturer will cease to
20 manufacture replacement spare parts, or will no longer provide
21 technical support) an assessment is made as to when the equipment
22 should be replaced based on the spare parts in inventory and the
23 length of time until the manufacturer ceases providing the spare parts.
24 There is no change in Hydro's current practice.

25

- 1 A. B-11 – Replacement of Governor Control – Upper Salmon (installed 1982)
- 2 (a) There have been 6 failures on the Upper Salmon governor controls
- 3 between 1996 – 2001.
- 4 (b) All spares recommended by the manufacturer were purchased with
- 5 the initial purchase of the governor system.
- 6 (c) Considering the cost of spares and spares available in Hydro's
- 7 inventory, Hydro decided not to purchase additional spares when the
- 8 manufacturer gave notice that the equipment would no longer be
- 9 supported.
- 10 (d) The Upper Salmon governor controls spare parts list as of 2001/07/11
- 11 is:

Part # Description	Available
12 58602417 Amplifier Assembly, 6960-048	2
13 58602493 Board Assembly, WW5430-544D	1
14 58602492 Board Assembly, WW5431-128A	2
15 58603004 Board Assembly, WW5431-216	1
16 58602405 Coil, WW1324-136	2
17 58602404 Element Strainer	8
18 58603006 Gasket, Woodward 206611	1
19 58602431 Gasket, Woodward 3051-558	1
20 58602438 Gasket, Woodward 3052-17	1
21 58603008 Gasket, Woodward 206517	2
22 58602429 Module Assembly, Amplifier 5438-116	2
23 58602423 Module Assembly, Derivative 5438-228	2
24 58602428 Module Assembly, Integrator 5432-048	2
25 58602420 Module Assembly, Linear & Pulse	2
26 Driver 5438-244	
27 58602421 Module Assembly, Power Amplifier 5438-234	2
28 58602424 Module Assembly, Proportional 5438-226	2
29	

1	58602422 Module Assembly, Rotation no Creep 548-232	2
2	58602425 Module Assembly, Speed Switch	2
3	1500 Hz 5432-028	
4	58602427 Module Assembly, Digital Speed 5438-336	1
5	58602419 Potentiometer, WW1658-244	1
6	81000987 Power Card Board, 5431-276A	2
7	58602496 Transducer, C/W oil motor 5800-511	2
8	58602484 Valve-Skinner, 1714562	1
9	58602505 Valve-Skinner, A356B12002	1

10

11 (e) Hydro's practice is to check with other utilities using similar equipment
12 in an attempt to obtain spares. Also, contact is made with other
13 manufacturers for supply and repair of the failed electronic cards.

14 (f) Yes, when a system is retired, its parts can be used as spares for
15 other identical systems in service in the overall Hydro system.
16 However, Upper Salmon Powerhouse is a single unit plant and its
17 governor controls are one of a kind in the Hydro system and hence its
18 parts cannot be used anywhere else in the Hydro system.

19 (g) In most cases original manufacturers do not provide detailed drawings
20 for the electronic cards, as these are considered proprietary. Also,
21 considering that Hydro has only a limited number of such systems in
22 service, it is not practical and cost effective to train an employee to the
23 level required for troubleshooting and repair of these complex
24 electronic cards. In the industry card repairs are usually performed by
25 the original manufacturers who have the detailed drawings and level
26 of expertise required for such repairs. Due to the lack of detailed
27 drawings no other manufacturer can perform and guarantee the
28 repairs of these electronic cards.

1 (h) When purchasing equipment, Hydro requests a list of recommended
2 spare parts from the manufacturer. The recommendations are
3 reviewed and an appropriate quantity of spare parts is purchased.
4 When Hydro becomes aware that equipment is about to become
5 obsolete (when we become aware that a manufacturer will cease to
6 manufacture replacement spare parts, or will no longer provide
7 technical support) an assessment is made as to when the equipment
8 should be replaced based on the spare parts in inventory and the
9 length of time until the manufacturer ceases providing the spare parts.
10 There is no change in Hydro's current practice.
11

- 1 A. B-13 – Upgrade Controls on Spherical Valve #5 – Bay d’Espoir
 2 (a) Failure Statistics for the equipment over the past 5 years:
 3

Event	Date	Description
1	96-02-18	Solenoid valve # 1 would not operate due to misalignment of the solenoid contacts, caused by service wear
2	96-03-15	Solenoid valve # 1 would not operate due to misalignment of the solenoid contacts, caused by service wear
3	96-11-18	Downstream seal failed to release due to failure of pressure switch, preventing unit from starting
4	97-01-03	Downstream seal failed to release due to failure of pressure switch, preventing unit from starting
5	97-10-14	Valve solenoid failed to operate due to solenoid contact problem
6	98-06-15	Duplex water filters, seized preventing the changing of filters
7	00-07-14	Pipe leaks at solenoid valve
8	00-09-15	Pipe leaks on the downstream side of the spherical valve, preventing the operation of this valve
9	00-12-12	Spherical valve failed to close on unit shutdown due to switch contact problem

- 4
 5 (b) One solenoid valve, one limit switch, one pressure switch, lamp
 6 holders, and one relay for each type of solenoid.
 7 (c) Hydro identified similar controls from other manufacturers, which can
 8 be substituted with some modification. No source for replacement
 9 solenoid valves and water-operated valves has been identified.
 10 (d) Substituted pressure and limit switches and two relays for the control
 11 of the solenoid valves.

- 1 (e) Hydro's practice is to check the inventories of other utilities using
2 similar equipment in an attempt to obtain spares. Other
3 manufacturers of similar equipment are contacted.
- 4 (f) Parts from retired systems are kept to use for similar systems to
5 maintain plant reliability, until all such systems are retired. Hydro's
6 practice has been to replace obsolete equipment to avoid having
7 several generations of similar (but not interchangeable) equipment on
8 units that are otherwise identical. The spherical valve is a critical
9 component, which isolates the unit during emergency shutdown. To
10 protect the unit, other property and to ensure the safety of personnel,
11 very reliable controls are required.
- 12 (g) The components which have become obsolete and for which direct
13 replacements cannot be obtained are control valves, of 1950's vintage
14 design, many of which were manufactured by casting. It is more cost
15 effective to replace the equipment with that of modern design than to
16 reverse engineer parts and try to locate a manufacturer that can
17 produce the components.
- 18 (h) When purchasing equipment, Hydro requests a list of recommended
19 spare parts from the manufacturer. The recommendations are
20 reviewed and an appropriate quantity of spare parts is purchased.
21 When Hydro becomes aware that equipment is about to become
22 obsolete (when we become aware that a manufacturer will cease to
23 manufacture replacement spare parts, or will no longer provide
24 technical support) an assessment is made as to whether it is more
25 cost effective to purchase a stock of spare parts or to replace the
26 equipment. There is no change in Hydro's current practice.
- 27

- 1 A. B-65 – Replace Power Line Carrier Equipment – Transmission System –
 2 West Coast.
 3 (a) The following are the failure statistics over the past five (5) years:
 4

EVENT	YEAR	NO. OF TICKETS ISSUED	% OF EQUIP. FAILURES AFFECTING SERVICE	REMARKS
1	1996	21	100%	Total number of equipment failures over the 5-year period is 100.
2	1997	19	100%	
3	1998	27	100%	
4	1999	20	100%	
5	2000	13	100%	

- 5
 6 (b) One complete set of spare modules was initially purchased for this
 7 equipment, based on the manufacturer’s recommendations. Typical
 8 manufacturer recommendations will address the number of systems in
 9 service, service locations and meantime between failure (MTBF) and
 10 meantime to repair (MTTR) to provide the reliability needed. Spare
 11 racks and chassis are not normally purchased.
 12 (c) No additional spares were purchased when Hydro was notified that
 13 the manufacturer was going to discontinue the product. The
 14 manufacturer’s recommended service life for the equipment is fifteen
 15 (15) years. The existing spares plus those removed from de-
 16 commissioned systems allowed Hydro to extend the life of the
 17 equipment by an average ten (10) years. The equipment’s physical
 18 condition has now deteriorated to a point where spares will no longer
 19 extend its life.
 20 (d) Our current inventory consists of three (3) sets of spare modules, the
 21 original set plus two (2) sets from retired system as noted in part (f).
 22 (e) On a case-by-case basis and when a decision is made to purchase
 23 additional spares on discontinued equipment, Hydro’s practice is to
 24 source the spares from the following sources:

- 1 1. original manufacturers
- 2 2. used equipment vendors
- 3 3. other utilities that are discontinuing use
- 4 (f) Spare parts from retired systems can be used to extend the life of
- 5 another system. In the case of the PLC systems, two (2) extra sets of
- 6 spares were obtained from decommissioned equipment.
- 7 (g) It is not practical to maintain spares through either employee training
- 8 or contracting others because:
- 9 1. many of the discrete components have been discontinued by the
- 10 manufacturer and
- 11 2. economy of scale in the limited number of installations to be
- 12 supported. In the case of the PLC systems, ABB is the only known
- 13 source of repair and component supply.
- 14 (h) No, Hydro has not changed its practices with respect to purchasing
- 15 spares. Hydro ensures that adequate spares are provided to meet or
- 16 exceed the service life of the equipment at the time of original
- 17 purchase, through the use of parts from other retired similar systems,
- 18 and by the purchase of additional spares from a variety of sources.
- 19

1 A. B-66 – Replace VHF Mobile Radio System (installed 1989 – not supported
 2 by mfg. Since 1991).

3 (a) The following are the failure statistics over the past five (5) years:

EVENT	YEAR	NO. OF TICKETS ISSUED	% OF EQUIP. FAILURES AFFECTING SERVICE	REMARKS
1	1996	46	75%	Total number of equipment failures over the 5-year period is 161.
2	1997	35	80%	
3	1998	36	80%	
4	1999	25	90%	
5	2000	19	70%	

4
 5 (b) Hydro purchased the manufacturer’s recommended spares consisting
 6 of switch modules, a spare site controller and several spare mobile
 7 and portable radios. Typical manufacturer’s recommendations will
 8 address the number of systems in service, service locations and
 9 meantime between failure (MTBF) and meantime to repair (MTTR) to
 10 provide the reliability needed. Spare racks and chassis are not
 11 normally purchased.

12 (c) When Hydro became aware that the manufacturer was to cease
 13 support of the product, some additional spares were purchased.
 14 Because the manufacturer only produced four (4) systems, a limited
 15 number of spares were available. Hydro was not able to purchase
 16 spares for the switch. When spares from a de-commissioned system
 17 became available three (3) years ago, Hydro purchased site controller
 18 spares but was not able to get spares for the switch.

19 (d) The spare parts currently in inventory include mobile and portable
 20 radios, a set of site controller spares and a partial set of switch spares.

21 (e) Hydro's practice is to source additional spares on discontinued
 22 equipment from the following sources:

- 23 1. original manufacturers

- 1 2. used equipment vendors
- 2 3. other utilities that are discontinuing use

3 (f) In this instance, parts removed from this system could be used in a
4 number of ways:

- 5 1. Mobile radios could be re-used in isolated locations which do not
6 have system coverage, such as coastal Labrador. This has been
7 done on occasion.
- 8 2. Repeater transmitters could be used as spare parts for paging
9 system transmitters.
- 10 3. Mobile radios which have defective Automatic Number Indication
11 (ANI) components, making them unusable on the Island system,
12 have been re-deployed in Labrador where the ANI feature is not
13 required. This has been done on occasion.
- 14 4. Spare site controller modules have been purchased from another
15 utility when their system was de-commissioned.

16 (g) It is not practical to maintain spares through either employee training
17 or contracting with others. Manufacturing techniques such as surface
18 mount and ASIC technology make maintenance of many components
19 of systems of this nature expensive or impossible for anyone but the
20 original equipment manufacturer. Software maintenance is also
21 required which would entail the procurement of tools, hardware, and
22 training which are not available due to the age of the equipment.
23 Hydro investigated procurement for a software development system
24 from the manufacturer 5 years ago but it would cost \$300,000 just for
25 the manufacturer to prepare to investigate the requirements.
26 Hydro has contracted the repair of modules and maintenance for all
27 parts of the VHF mobile radio system.

28 (h) No, Hydro has not changed its practices with respect to purchasing
29 spares. Hydro ensures that adequate spares are provided to meet or

1 exceed the service life of the equipment at the time of original
2 purchase, through the use of parts from other retired similar systems,
3 and by the purchase of additional spares from a variety of sources.
4

- 1 A. B-67 – Replace Tele-protection – Stony Brook – Grand Falls Frequency
2 Converter.
- 3 (a) The failure statistics are not available. The data is recorded as part of
4 general teleprotection failures and is not available for this particular
5 unit.
- 6 (b) One complete set of spares was purchased based on the
7 manufacturer’s recommendations. Typical manufacturer ‘s
8 recommendations will address the number of systems in service,
9 service locations and meantime between failure (MTBF) and
10 meantime to repair (MTTR) to provide the reliability needed. Spare
11 racks and chassis are not normally purchased.
- 12 (c) The original equipment manufacturer was bought out and the product
13 line was dropped. Hydro was not notified of this but rather found out a
14 year later when spares were returned for repair. Attempts to purchase
15 additional spare units was not successful.
- 16 (d) One complete set of spares is currently in inventory.
- 17 (e) Hydro’s practice is to source additional spares on discontinued
18 equipment from the following sources:
19 1. original manufacturers
20 2. used equipment vendors
21 3. other utilities that are discontinuing use
- 22 (f) The teleprotection unit being replaced is the only one of its kind
23 installed by Hydro.
- 24 (g) This is not practical for this level of technology for only one system.
- 25 (h) No, Hydro has not changed its practices with respect to purchasing
26 spares. Hydro ensures that adequate spares are provided to meet or
27 exceed the service life of the equipment at the time of original
28 purchase, through the use of parts from other retired similar systems,
29 and by the purchase of additional spares from a variety of sources.

1 A. B-68 – Replace UHF Radio – Upper Salmon (20 years old)

2 (a) The following are the failure statistics over the past five (5) years:

3

EVENT	YEAR	NO. OF TICKETS ISSUED	% OF EQUIP. FAILURES AFFECTING SERVICE	REMARKS
1	1996	2	100%	Total number of equipment failures over the 5-year period is 16.
2	1997	5	100%	
3	1998	4	100%	
4	1999	3	100%	
5	2000	2	100%	

4

5 (b) Initially one complete set of spares was purchased based on the
6 manufacturer’s recommendations. Typical manufacturer ‘s
7 recommendations will address the number of systems in service,
8 service locations and meantime between failure (MTBF) and
9 meantime to repair (MTTR) to provide the reliability needed. Spare
10 racks and chassis are not normally purchased.

11 (c) No additional spares were purchased when support for this equipment
12 was discontinued by the manufacturer because the equipment had
13 already exceeded its designed service life.

14 (d) At present an incomplete set of spares are in inventory. Some spare
15 modules were installed in the system and some damaged modules
16 could not be repaired.

17 (e) Hydro’s practice is to source additional spares on discontinued
18 equipment from the following sources:

- 19 1. original manufacturers
- 20 2. used equipment vendors
- 21 3. other utilities that are discontinuing use

22 (f) This is the only system with this type of radio equipment; therefore the
23 de-commissioned equipment cannot be used for spares for other

1 systems. When the equipment at the Hinds Lake Plant was removed,
2 its spares were used to support another UHF link.

3 (g) It is not practical to maintain spares through either employee training
4 or contracting other for this level of technology and a limited set of
5 radios. Contact with the original equipment manufacturer
6 Harris/Farinon confirms that the equipment is discontinued by the
7 manufacturer and spares are no longer available.

8 (h) No, Hydro has not changed its practices with respect to purchasing
9 spares. Hydro ensures that adequate spares are provided to meet or
10 exceed the service life of the equipment at the time of original
11 purchase, through the use of parts from other retired similar systems,
12 and by the purchase of additional spares from a variety of sources.

13

1 A. B-70 – Replace Remote Terminal Unit for Hydro – Phase 3

2 (a) The following are the failure statistics over the past five (5) years:

EVENT	YEAR	NO. OF TICKETS ISSUED	% OF EQUIP. FAILURES AFFECTING SERVICE	REMARKS
1	1996	72	100%	Total number of equipment failures over the 5-year period is 272.
2	1997	54	100%	
3	1998	56	100%	
4	1999	48	100%	
5	2000	42	100%	

3

4 (b) Two sets of spares were initially purchased for this type of RTU.

5 Typical manufacturer's recommendations will address the number of
6 systems in service, service locations and meantime between failure
7 (MTBF) and meantime to repair (MTTR) to provide the reliability
8 needed. Spare racks and chassis are not normally purchased.

9 (c) Additional spares were purchased when support by the manufacturer
10 was discontinued in 1990. The manufacturer's recommended
11 operating life for this equipment has been exceeded. It should be
12 noted that these RTU's have been upgraded twice to replace obsolete
13 components and to provide additional functionality.

14 (d) Three sets of spares are now currently in inventory. Additional spares
15 were obtained from decommissioned equipment.

16 (e) Hydro's practice is to source additional spares on discontinued
17 equipment from the following sources:

- 18 1. original manufacturers
- 19 2. used equipment vendors
- 20 3. other utilities that are discontinuing use

21 (f) Yes. The spares are being used to maintain the other systems until
22 they are replaced.

23 (g) We currently use trained employees to maintain the spares.

- 1 (h) No, Hydro has not changed its practices with respect to purchasing
2 spares. Hydro ensures that adequate spares are provided to meet or
3 exceed the service life of the equipment at the time of original
4 purchase, through the use of parts from other retired similar systems,
5 and by the purchase of additional spares from a variety of sources.
6

- 1 A. B-73 – Replace Telephone Isolation Equipment – Sunnyside & Western
2 Avalon
- 3 (a) There have been no failures of this equipment at these stations for
4 the past five (5) years. This equipment is not being replaced due to
5 obsolescence or lack of spares. The original equipment installed
6 required a large physical clearance to adjacent equipment to
7 maintain safety standards and with the addition of other equipment in
8 the station over the past years clearances have been compromised.
9 The fibre cable technology will provide greater safety, reliability and
10 bandwidth while eliminating the requirement for physical separation.
11 The equipment removed will be used as spares to support other
12 sites.
- 13 (b) Initially one (1) set of spares was purchased to maintain the
14 equipment.
- 15 (c) Not applicable.
- 16 (d) Presently there are two (2) sets of spares in inventory to support the
17 telephone isolation equipment which is still supported by the
18 manufacturer.
- 19 (e) Not applicable.
- 20 (f) The modules removed from these sites will be placed in inventory to
21 support the other sites.
- 22 (g) The manufacturer provides support for all equipment repairs. The
23 telephone isolation equipment at Sunnyside and Western Avalon is
24 not being removed because of obsolescence or lack of spare, see part
25 (a) for details.
- 26 (h) No, Hydro has not changed its practices with respect to purchasing
27 spares. Hydro ensures that adequate spares are provided to meet or
28 exceed the service life of the equipment at the time of original

1 purchase, through the use of parts from other retired similar systems,
2 and by the purchase of additional spares from a variety of sources.