

SUSTAINING OM&A

1.0 INTRODUCTION

Distribution Sustaining OM&A represents expenditures required to maintain existing distribution lines and stations facilities so that they will continue to function as originally designed. Hydro One Distribution manages its Sustaining OM&A program by dividing the program into four categories: stations, lines, vegetation management, and meters.

The expenditures covered under the Sustaining OM&A program are intended to ensure that the reliability of the system is improved where it is cost effective to do so, customer commitments are achieved, and that all legislative, regulatory, environmental and safety requirements are met. Hydro One Distribution sustaining OM&A programs and proposed spending levels for 2008 are described below.

2.0 DISCUSSION

Distribution assets and their components are subject to deterioration and failure over time. Appropriate maintenance practices ensure that the life of assets is optimized and will help protect against major equipment failures and associated reliability problems. Maintenance programs are designed with recognition that asset integrity is influenced by factors such as condition, design, environment, deterioration with age, and equipment utilization. As assets deteriorate, equipment performance usually suffers resulting in increased environmental risks and an increase in potential safety hazards to both the public and employees, and a decrease in system reliability. Ultimately, assets will deteriorate to the point that they are no longer able to perform their function(s) effectively or where current year or longer term costs of maintaining the asset exceed the costs of replacement. At this point, it becomes more cost-effective to replace an asset rather than

1 to continue to repair or maintain. Replacement of capital assets is discussed in Exhibit
2 D1, Tab 3, Schedule 2.

3
4 Sustaining OM&A programs fund both planned and unplanned work. The planned
5 programs represent the work required to preserve the functionality of the distribution
6 system by maintaining or replacing defective components and managing rights-of-way to
7 ensure vegetation growth does not adversely affect system reliability. The determination
8 of which specific facilities need to be maintained is in part based on the comprehensive
9 Asset Condition Assessment (ACA) process described in Exhibit D1, Tab 2, Schedule 1.
10 The condition of assets is one consideration in determining the need to schedule
11 maintenance. Other factors include historical performance, asset criticality, asset
12 demographics, availability of spare equipment and material, local customer impacts and
13 the business drivers as detailed in the work program prioritization process discussed at
14 Exhibit A, Tab 14, Schedule 5. The prioritization process allows all distribution
15 programs to be ranked and compared to one another so that investments can be directed
16 to where they provide the maximum business value.

17
18 Sustaining OM&A includes demand work, also referred to as unplanned work. Demand
19 work involves responding to customer outages and restoring power on a twenty-four hour
20 basis, responding to safety issues, managing billing meters to ensure they are replaced
21 upon failure, responding to customer requests to remove hazardous trees, responding to
22 requests to locate underground power cables, and replacing or repairing failed equipment.
23 The variable nature of this work requires Hydro One Distribution to forecast costs based
24 on historical averages of cost and volume of work, with adjustments made to reflect
25 anticipated changes in expenditure patterns and work requirements.

26
27 Demand work requires an immediate or timely response to customer, safety and system
28 needs, and is initiated by interruptions to service, line and station inspection findings, and

customer and property owner requests. Hydro One Distribution maintains infrastructure, equipment and resources to respond to these issues within the appropriate time frame as they arise. Some demand work does not pose the same degree of urgency, and in these instances, the work is scheduled over time based on knowledge of the condition of the assets and coordinated in a cost effective manner with other work.

The spending for 2008, along with the spending levels for the bridge and historic years are provided in Table 1 below.

Table 1
Sustaining OM&A
(\$ Millions)

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Stations	18.4	19.9	26.0	25.0	24.9
Lines	92.4	105.3	126.5	124.6	118.1
Meters	8.2	10.3	14.0	15.7	17.6
Vegetation Management	88.9	86.4	89.1	115.0	119.4
Total	207.9	222.0	255.6	278.8	280.0

The change in overall spending for 2008 relative to historic expenditures is attributed to the following reasons:

- Increased vegetation management line clearing and brush control to manage and improve reliability.
- Increased maintenance on distribution station transformers to restore the condition of these aging assets.
- Maintenance and other OM&A spending for Smart Meters.
- Continuing efforts on lines data collection and increased emphasis in defect corrections to manage reliability and safety

1 These increases are discussed in more detail below.

2

3 **2.1 Stations**

4

5 Hydro One Distribution owns and operates 1,006 distribution and regulating stations
 6 province-wide. Stations are used for the delivery of power, voltage transformation, and
 7 switching. Station facilities typically contain the following components: power
 8 transformers, instrument devices, fuses, reclosers, disconnect switches, bus, insulators,
 9 support structures, power cables, cable terminators, surge arresters, station service
 10 supplies, grounding systems, fences, mobile substation facilities and buildings.

11

12 Stations sustaining OM&A covers investments required to maintain existing assets
 13 located within distributing stations, regulating stations, as well as Hydro One
 14 Distribution's 28 mobile substations. The work is divided among three programs as
 15 noted in Table 2 below. Funding for 2008 along with the spending levels for the bridge
 16 and historic years are provided in Table 2 below.

17

18

19

20

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Table 2
Stations Sustaining OM&A
(\$ Millions)

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Stations Demand and Corrective Maintenance (d)	6.2	6.7	7.0	6.9	6.1
Planned Station Maintenance	6.6	8.9	12.1	13.1	12.9
Land Assessment and Remediation	5.6	4.3	6.9	5.1	5.9
Total	18.4	19.9	26.0	25.0	24.9

22 (d) – indicates this is a demand program

23

1 2.1.1 Stations Demand and Corrective Maintenance

2
3 This program covers emergency work required to respond to component failures at
4 distributing and regulating stations, correct situations where there is a likelihood of
5 failure that could cause a power interruption or present a safety hazard, and to complete
6 unplanned corrective work discovered during planned maintenance activities that cannot
7 be deferred until the next planned maintenance. When station components fail, the
8 consequence is typically a service interruption to customers. Station interruptions can
9 impact a large number of customers, typically from 1,000 to 10,000 customers per
10 interruption. Emergency and corrective maintenance work must be carried out in a timely
11 manner in order to minimize the risks to customer reliability and safety.

12
13 In most cases, smaller components such as reclosers, insulators, connectors, switches, etc.
14 will be repaired, temporarily bypassed, or replaced on site. The failure of a large
15 component, such as a transformer, may require moving the equipment off site and
16 repairing it at a central location. If a prolonged service interruption is anticipated, service
17 is typically restored through the temporary use of a mobile substation.

18
19 The 2008 spending requirement for this program is \$6.1 million and is within 10% of
20 historic expenditures except for 2006. During 2006 copper theft and a number of site
21 security and safety problems were identified that required corrective action.

22
23 2.1.2 Planned Station Maintenance

24
25 The planned station maintenance work program includes station inspections, power
26 equipment maintenance, asset condition assessments, grounds and site maintenance, and
27 maintenance of mobile substations. A planned maintenance program is required to
28 reduce the risk of equipment failure, which can impact reliability of service to the large

1 number of customers typically supplied from a station. Planned maintenance also
2 ensures equipment reaches its maximum economic life potential and limits the amount of
3 unplanned maintenance in future years.

4
5 Appendix C of the Distribution System Code requires all LDCs to inspect their stations
6 on a regular basis to identify obvious structural problems, hazards and signs of
7 vandalism. Hydro One Distribution's stations are inspected two times per year in rural
8 areas and monthly in urban areas as stipulated in the Distribution System Code. The
9 2008 spending for this activity is \$2.0 million. Inspections identify obvious problems
10 and safety hazards prior to initiating the planned maintenance work. The planned
11 maintenance of stations is required to preserve operational integrity and to correct
12 equipment defects before they cause outages and reduce the reliability of service to
13 customers, or impact employee safety.

14
15 A preventive maintenance optimization (PMO) approach has been adopted, where
16 appropriate, for the planned maintenance of station assets. PMO is a structured program
17 that best utilizes a company's resources to efficiently and effectively execute its
18 maintenance requirements. Using a PMO process, detailed analysis of failure modes,
19 causal impacts, and asset criticality are all considered in evaluating preventative
20 measures. The end result of PMO will be a listing of routine maintenance tasks that are
21 the most technically correct and cost-effective to address the causes of critical modes of
22 failure, as opposed to the more traditional standardized time based maintenance
23 approach.

24
25 The 6,000 station reclosers are maintained on a 6 year interval, and airbreak switches,
26 circuit switchers, high voltage fuses, and transformer underload tap changers are
27 maintained on a similar interval. These activities, in addition to mid-life maintenance

1 overhaul on major equipment, management of station PCBs, transformer diagnostics and
2 technical services account for a 2008 spending of \$8.6 million.

3
4 Station grounds and site maintenance includes weed control, snow removal, fence repair,
5 access road maintenance, site drainage and foundation repairs, and accounts for a 2008
6 spending of \$1.6 million.

7
8 Hydro One Distribution's 28 mobile substations play a key role in providing reliable
9 service to customers. They provide emergency backup, should a distributing station fail,
10 and facilitate planned maintenance programs at distributing stations, as well as providing
11 load relief during heavy load periods in the summer or winter. As such, planned
12 maintenance of mobile substations is required to ensure these critical units are available
13 and in good working condition when required. The cost to maintain the mobile
14 substations during 2008 is estimated to be \$0.7 million.

15
16 The total 2008 spending requirement for Planned Station Maintenance is \$12.9 million to
17 maintain 1,006 station sites and associated equipment including infrastructure. The 2008
18 spending is about the same as the bridge year spending and a 7% increase over 2006
19 expenditures. The increase in spending is attributed to a need for added transformer
20 maintenance and mid-life overhauls as identified through inspections and diagnostic
21 activities.

22
23 Maintenance plans initiated during 2005 are showing benefits. Increased use of
24 transformer diagnostics (dissolved gas analysis), and the removal of suspect transformers
25 from service in a proactive manner based on the results of the diagnostic tests, have
26 enabled a reduction of forced outages (i.e. failures). A reduction in failures has benefits to
27 customer reliability and avoids environmental contamination from spilled or burning
28 insulating oil. It is important that the coordinated maintenance strategy (i.e., ACA,

1 proactive removal of suspect transformers and mid-life overhauls) adopted for this aging
2 class of key assets be maintained in order to increase the life of these assets and to keep
3 failures in check over the longer term.

4
5 2.1.3 Land Assessment and Remediation

6
7 Hydro One Distribution owns 1,006 distribution and regulating station properties across
8 Ontario. Soil contamination has occurred over time within some of the properties as a
9 result of the following: application of certain long lasting chemicals, such as wood
10 preservatives and arsenic-based herbicides; storage and use of mineral insulating oil, fuel,
11 PCBs, and miscellaneous other materials. The historical use and storage of these
12 materials and chemicals met all applicable environment regulations and guidelines at the
13 time that they were first used. Approximately 45% of these properties have some level
14 of on-site soil contamination, exceeding applicable Ministry of Environment land-use
15 criterion. Because contaminated properties have the potential to cause adverse effects on
16 people and the environment, Hydro One Distribution has undertaken to assess their
17 properties and carry out remedial work where environmental risks are significant. The
18 ACA process described in Exhibit D1, Tab 2, Schedule 1 provides additional details
19 concerning Land Assessment and Remediation.

20
21 The Land Assessment and Remediation program's primary focus is to reduce the human
22 and ecological risk of off-property impacts, through the implementation of remedial
23 measures to treat, remove or otherwise manage the contamination found off-site and/or
24 the implementation of on-site management controls to mitigate future off-property
25 impacts.

26
27 The 2008 spending requirement for this program is \$5.9 million. This level of funding is
28 required to complete assessments and required remedial work on 8 priority sites. This

1 volume of work aligns with a managed remediation schedule that would address all high
 2 to medium risk sites within the next 5 years. Historic costs have varied year over year
 3 due to the complexity and volume of work needed to address the particular sites during
 4 any given year.

5
 6 **2.2 Lines**

7
 8 Distribution lines total 119,900 circuit km province-wide and are used to deliver power to
 9 Hydro One Distribution customers. Lines are constructed on road allowances where
 10 possible, or on rights-of-way for which Hydro One Distribution has legal rights to
 11 occupy. Line components include poles, conductor, transformers, switches, fuses, surge
 12 arresters, voltage regulators, capacitors, insulators, guy anchors and reclosers.

13
 14 Funding under lines sustaining OM&A provides for investments required to maintain the
 15 integrity of the distribution lines system. The work is divided among four categories,
 16 Trouble Call/Cable Locates/Reconnect and Disconnects, Line Maintenance, Waste
 17 Management and Other Services. Funding for 2008, along with the spending levels for
 18 the bridge and historic years, are provided in Table 3 below.

19
 20 **Table 3**
 21 **Lines Sustaining OM&A**
 22 **(\$ Millions)**
 23

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Trouble Call Response, Cable Locates and Disconnects/Reconnects (d)	67.2	73.8	89.2	78.6	76.9
Line Maintenance	15.2	19.3	26.7	30.2	28.8
Waste Management	2.7	2.8	3.2	3.1	3.0
Other Services	7.3	9.4	7.4	12.7	9.4
Total	92.4	105.3	126.5	124.6	118.1

24 (d) – indicates this is a demand program

2.2.1 Trouble Calls, Underground Cable Locates, Disconnects/Reconnects

These demand programs provide funding for responding to customer service interruptions and power quality concerns and for customer-driven service response activity. The externally driven nature of this work requires Hydro One Distribution to forecast costs based on historical averages with adjustments made to reflect anticipated changes in expenditure patterns or work requirements. The funding is divided into three programs as shown in Table 4.

Table 4
Trouble Calls, Locates, Disconnects/Reconnects
(\$ Millions)

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Trouble Calls (d)	51.5	56.8	70.9	57.6	58.9
Underground Cable Locates(d)	9.1	10.2	10.7	12.4	10.5
Disconnects/Reconnects (d)	6.6	6.8	7.6	8.6	7.5
Total	67.2	73.8	89.2	78.6	76.9

(d) – indicates this is a demand program

Trouble Calls

The Trouble Call program is required to address unplanned power interruptions to customers, customer power quality related complaints, and the emergency repair of equipment and component defects found on the distribution system.

Unplanned power interruptions on the distribution system are largely due to line component failures and/or contact with right-of-way vegetation (trees). Line component failures can be caused by severe weather conditions (e.g. snow/ice, wind, lightning), right-of-way vegetation falling into lines and system component deterioration. Tree

1 related interruptions are largely due to trees falling onto lines or branches contacting the
2 lines, and in many cases are due to adverse weather conditions.

3
4 Service quality complaints from customers can include concern with momentary outages
5 (flickering lights), radio and television interference and high neutral voltage (also known
6 as ‘tingle voltage’ in the farming community).

7
8 The Trouble Call program also addresses assets that are in immediate need of repair or
9 replacement, or encroachment of vegetation that has the potential to cause an outage
10 within a short period of time. If not attended to, these types of defects may ultimately
11 result in a power interruption to customers or create a safety hazard to the public or
12 employees.

13
14 The majority of trouble calls result in an interruption to customers and/or power quality
15 degradation. Service interruptions can impact from one customer to thousands of
16 customers depending on the severity of the incident and system configuration. Service
17 restoration requires that the defective component be repaired, temporarily bypassed, or
18 replaced by crews dispatched to the site at any time, day or night. Defective equipment,
19 if categorized as a capital component would be replaced under Sustaining Capital as
20 discussed in Exhibit D1, Tab 3, Schedule 2.

21
22 This program is reactive in nature and will vary due to external factors such as weather
23 severity (e.g. storms), variability in equipment deterioration, random equipment failures,
24 and the volume of customer power quality complaints. Historically, there are
25 approximately 50,000 trouble calls responded to annually, of which roughly one-third are
26 incidents that do not cause a service interruption, but pose a high risk to the reliability of
27 supply or safety, and need to be addressed in an expedient manner.

1 Hydro One Distribution must address trouble calls in order to comply with legal and
2 regulatory requirements to correct known hazardous problems and to maintain safe and
3 reliable electric service in accordance with good utility practice. Performance on this
4 program will impact the system reliability service quality indicators specified by the OEB
5 in the Electricity Distribution Rate Handbook, Sections 15.2.1 and 15.2.3.

6
7 The 2008 spending requirement for this program is \$58.9 million based on a forecast
8 volume of 49,100 Trouble Calls and an allowance for storm related costs that are not
9 capitalized, i.e., vegetation management and overtime accumulated during storm events.
10 The 2008 allowance for OM&A storm related costs is \$6 million. The proposed
11 spending takes into account observed historic volumes and historic expenditures for
12 storm response. Trouble Call volumes have remained relatively steady but increasing
13 expenditures associated with storm activity since 2004 have placed greater demands on
14 program expenditures.

15
16 Spending for 2008 is projected to be 17% lower than 2006 actual costs. During 2006
17 there were an unusually high number of damaging storms resulting in much higher storm
18 related costs than normal. It is expected that spending of this magnitude will be not
19 required during 2008.

20
21 Underground Cable Locates

22
23 This program provides a service of locating and marking Hydro One Distribution
24 underground plant for customers and contractors who require this information prior to
25 excavating. This service is provided in accordance with the Electrical Safety Authority's
26 (ESA) "Guidelines for Excavating in the Vicinity of Distribution Lines". The program
27 costs are not recovered through end-user charges in order to encourage property owners
28 and contractors to make use of this service and avoid hazardous situations that can cause

1 serious injury. This approach is consistent with the practice followed by other regulated
2 utilities, including telephone service and natural gas utilities.

3
4 Program funding is driven by external demand and varies based on the amount of public
5 and economic development activity in any given year. Hydro One Distribution has seen
6 an approximate 12% increase in volume since 2004 from 73,001 to 81,975 locates during
7 2006, due mainly to an increased number of locates generated by increased public
8 awareness of the “call before you dig” message.

9
10 Performance on this program is tracked by the “Underground Cable Locates” service
11 quality indicator specified by the OEB in the Electricity Distribution Rate Handbook,
12 Section 15.1.2. Refer to Exhibit A, Tab 15, Schedule 1 for additional details.

13
14 The 2008 spending requirement for this program is \$10.5 million and is based on a
15 projected volume of 75,800 cable locate requests. The volume forecast is derived using a
16 4 year average with adjustments made to incorporate recent trending in volumes. The
17 projected spending maintains recent historic expenditures.

18
19 Service Disconnects and Reconnects

20
21 This program funds the provision of service to customers, or their contractors, who
22 require isolation from the distribution system to facilitate working safely around the
23 customer-owned portion of a distribution line (e.g., clearing trees and vegetation or
24 working on customer-owned equipment). When customers complete their work, the
25 service is reconnected and returned to normal conditions. There is no cost to the
26 customer for providing this service once per calendar year during normal working hours
27 in order to encourage customers to maintain their facilities and to work safely.

1 Performance on this program contributes to the “Appointments” service quality indicator
2 specified by the OEB in the Electricity Distribution Rate Handbook, Section 15.1.4.

3

4 The 2008 spending requirement for this program is \$7.5 million to complete a forecast
5 10,600 disconnect/reconnect requests. The volume forecast is derived using a 4 year
6 average with adjustments made to incorporate recent trending in volumes

7

8 2.2.2 Line Maintenance

9

10 The line maintenance program includes funding to gather information needed to
11 effectively manage the line assets and to carry out ongoing equipment maintenance to
12 maximize the life of these assets and to ensure performance and operability of equipment.
13 As well, defective equipment or components at end of life are replaced or repaired under
14 the corrective programs within line maintenance.

15

16 Line maintenance is divided into 3 program categories: Line Patrols/Wood Pole
17 Assessment and Asset Data Collection; Preventative and Corrective Maintenance; and
18 Sentinel Lights. Funding for 2008, along with spending levels for the bridge and historic
19 years, are provided in Table 5 below.

Table 5
Line Maintenance
(\$ Millions)

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Line Patrols, Wood Pole Assessment & Asset Data Collection	8.1	8.1	13.1	15.4	13.4
Preventative & Corrective Maintenance	7.2	9.7	12.3	13.6	13.7
Sentinel Lights (d)	*	1.5	1.4	1.3	1.6
Total	15.2	19.3	26.7	30.2	28.8

5 (d) – indicates this is a demand program

6 * During 2004 sentinel lights were treated as a non-utility expense and as such were not included in the revenue requirement. The cost
 7 during 2004 was \$2.0 million.

8

9 2.2.2.1 Line Patrols, Wood Pole Assessment and Data Collection

10

11 Appendix C of the Distribution System Code requires that all local distribution
 12 companies patrol their distribution lines to identify structural problems, damaged
 13 equipment and components that may cause a power interruption, as well as any hazards
 14 such as leaning poles, damaged equipment enclosures, and vandalism. Hydro One
 15 Distribution is required to patrol one-sixth of all rural distribution feeders and one-third
 16 of urban feeders each year to identify defects for corrective action. Those defects
 17 requiring immediate attention are corrected under the trouble call programs as discussed
 18 in section 2.2.1 of this Schedule and Exhibit D1, Tab 2, Schedule 2 for capital
 19 expenditures. The less serious defects are addressed on a planned basis in the appropriate
 20 time frame. The approach adopted by Hydro One Distribution for line patrols meets the
 21 requirements of the Distribution System Code, and combines patrol activities with asset
 22 condition assessment required to effectively plan future corrective work, and data
 23 collection on assets needed to improve the future management of these assets. Using an
 24 integrated approach that combines line patrols, asset condition assessment and data

1 collection to acquire information during one site visit is the most cost effective means of
2 acquiring the information needed to effectively manage the distribution lines system.

3
4 As part of the patrols, each pole is assessed visually and sounded to identify voids in a
5 pole that may jeopardize its structural integrity. During the assessment, a pole may be
6 identified to be at end-of-life, in need of follow-up testing if there is uncertainty
7 concerning end-of-life, or given an acceptable rating. Follow-up testing, if needed, will
8 involve a measurement of the remaining sound wood and the degree of wood decay,
9 internal and external. The pole assessment and test results are used to plan future pole
10 replacements as well as supporting the need for line refurbishment and line upgrades.

11
12 About 18,000 km of rural and urban patrols are completed annually, with about 300,000
13 poles assessed out of a total of 1,650,000. The findings are recorded in a database where
14 the nature of a deficiency and suggested follow-up actions are highlighted.

15
16 When a pole is assessed, the geographic coordinates of the pole are captured, equipment
17 and line components on the pole identified, condition assessed and all information is
18 recorded in electronic format and entered into Hydro One Distribution's Asset Condition
19 Assessment Database. The line data capture was started in 2005 and will be complete by
20 2010, at which time all lines will have been patrolled and poles assessed. This scope of
21 work was recognized during the 2006 Rates proceeding as an implementation of good
22 utility practice.

23
24 This program helps ensure that reliability and safety problems are identified and
25 corrected, provides information needed to plan replacement of defective poles and
26 equipment, and ensures valuable asset information is obtained that will improve the
27 management of the line assets in the future.

1 The 2008 spending requirement for this program is \$13.4 million. These expenditures
2 are required to complete line inspections as required by the OEB, remain on schedule to
3 complete the data collection by 2010, and assess poles during inspections.

4
5 The 2008 spending is similar to 2006 expenditures.

6
7 Reduced funding for this work will prevent Hydro One Distribution from realizing the
8 benefits that can be achieved by having more detailed information on its asset base.

9
10 The lines data collection is in the early stages, however the Company is starting to see the
11 benefits from a planning and work execution perspective. The line data collected to date
12 has provided benefits in a number of areas, including; allowing more accurate
13 identification of the number of wood poles requiring replacement; providing a centralized
14 repository of line defects that enables more efficient scheduling and bundling of work for
15 field crews; and reducing the time for job planning and site visits, and easier
16 identification of the work location through the availability of geographic coordinates.

17 18 2.2.2.2 Preventative and Corrective Maintenance

19
20 Hydro One Distribution's lines preventative maintenance program includes equipment
21 maintenance that is carried out primarily on a time based schedule and adjusted based on
22 the Preventative Maintenance Optimization (PMO) approach.

23
24 The equipment maintained includes line reclosers, line regulators, three-phase airbreak
25 switches, underground and submarine cable and insulator washing to remove salt
26 accumulation at locations where there has been a history of problems. There are
27 approximately 17,000 reclosers, 3,000 line regulators, 1,500 three phase switches. The

1 2008 plan is to maintain 1,850 reclosers, 150 line regulators, 150 three-phase switches,
2 500 pad mounted transformers at underground cable locations and wash insulators on
3 about 8,000 structures. The projected 2008 spending requirement for these activities is
4 \$3.8 million.

5

6 Distribution line defects such as broken guy wires, damaged insulators, and defective
7 lightning arresters are identified and logged during line patrols as described in
8 Section 2.2.2.1 under this Schedule. The defects identified are categorized based on the
9 requirements of the Distribution System Code and corrected in an appropriate time frame.

10

11 As well as the normal deterioration that is addressed through the end of life component
12 replacement programs and ongoing defect corrections, Hydro One Distribution has
13 identified several system wide problems that need to be addressed in the near term. One
14 such system wide problem is a type of polymeric insulator known as EPAC that has a
15 history of failing prematurely due to a design flaw that allows moisture ingress under the
16 polymeric cover that protects the fiberglass rod. This situation has resulted in insulator
17 failures well before the expected end of life and has required the implementation of work
18 restrictions to address safety risks. These insulators as well as other defective line
19 components are identified during the patrols and scheduled for corrective action. The
20 2008 spending requirement for defect corrections is \$9.9 million and includes the
21 replacement of 6,500 EPAC insulators 3,850 other insulators and about 9,000 other
22 defects that need to be addressed to ensure the reliability and safety of the distribution
23 system.

24

25 The 2008 spending requirement for the preventative and corrective maintenance
26 programs is \$13.7 million which maintains the spending for the bridge year. The increase
27 in expenditures over historic amounts is attributed to the need for addressing an increase

1 in defects identified during line patrols and a greater emphasis on equipment
2 maintenance with a goal of improving reliability.

3 Reduced funding in the preventative maintenance program will reduce the performance
4 of line protective and isolating equipment needed to minimize customer impacts during
5 power interruptions. Reductions in the corrective program will increase the failure rate of
6 equipment and line components, resulting in more frequent and longer duration outages
7 to customers and increased safety risks. Reductions will lead to a deteriorating trend in
8 reliability over time.

9

10 2.2.2.3 Sentinel Lights

11

12 The sentinel light program provides outdoors dusk-to-dawn lighting for rural customers
13 and has been in existence in Ontario for over 20 years. Hydro One Distribution has a
14 contractual obligation to honour commitments made by the former Ontario Hydro for
15 present installations, but no longer accepts requests for new sentinel light installations.

16

17 The current inventory of sentinel lights totals about 41,100 and drives an annual
18 maintenance program between 4,000 and 5,000 maintenance responses.

19

20 The 2008 spending requirement for this program is \$1.6 million. The forecast is based on
21 historic volumes with adjustments made to incorporate recent trending in volumes and
22 cost. The projected spending maintains historic averages.

23 Hydro One Distribution is required to honour agreements currently in place, as such,
24 there is no alternative other than to respond to the maintenance requests.

25

1 2.2.3 Waste Management and PCB Lines Transformer Oil

2
3 This program ensures that wastes generated during the course of maintaining distribution
4 assets are managed in an environmentally responsible manner and in compliance with
5 Federal, Provincial and Municipal regulations. Oils are used in a number of equipment
6 types and may enter the environment should equipment fail. In such instances, Hydro
7 One Distribution must respond to minimize impacts to the environment.

8
9 The 2008 funding, along with spending levels for the bridge and historic years, are
10 provided in Table 6 below.

11
12 **Table 6**
13 **Waste Management**
14 **(\$ Millions)**
15

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Waste Management	2.7	2.8	3.2	3.1	3.0

16
17 2.2.3.1 Waste Management

18
19 Once transformers and other distribution equipment are removed from service, there is a
20 requirement to manage the solid and liquid waste materials, which includes reporting of
21 PCB inventories to regulatory authorities, disposal and destruction of these inventories,
22 disposal of non-contaminated oils, and management and disposal of other wastes. Waste
23 and PCB management will be an ongoing activity as Hydro One Distribution has 475,000
24 distribution line transformers and a number of other equipment types that will generate
25 wastes as they are removed from service. These wastes will need to be managed in an
26 environmentally approved manner

27 .

1 The 2008 spending requirement for this program is \$3.0 million, which maintains the
2 amount being projected for the bridge year and is slightly less than the 2006
3 expenditures.

4
5 Reduced funding in this program would impact Hydro One Distribution's environmental
6 stewardship commitment for responsible waste management and hamper the ability to
7 comply with waste management regulations.

8
9 2.2.3.2 PCB Lines Transformer Oil

10
11 Distribution pole-mount and pad-mounted transformers manufactured prior to 1980
12 contain insulating oil that may contain polychlorinated biphenyl (PCB) compounds.
13 Regulations at this time place strict due diligence requirements on situations where
14 PCB's have potential to enter the environment or have entered the environment as a result
15 of transformer failure or oil leakage, but there are no regulations mandating the
16 elimination of PCB contaminated oil. Environment Canada is proposing to change
17 regulations to eliminate PCB contaminated oil above 50 ppm by 2014 in pad-mount
18 transformers and by 2025 in pole-mount transformers. Hydro One Distribution has
19 elected to wait until regulations are enacted before a plan is implemented to test and
20 inspect transformers, and as such the 2008 program does not include any funding for
21 proactive PCB testing and inspections of line transformers. Should Environment Canada
22 regulations be enacted as currently proposed, it is estimated that Hydro One Distribution
23 will be required to test about 200,000 transformers prior to 2025 at an annual cost of
24 about \$8 million. It is emphasized that this application does not contain any allowance
25 to fund transformer oil sampling and testing should Environment Canada proceed with
26 the regulations as proposed.

1 The proposed Environment Canada regulations, if enacted, will not only increase OM&A
 2 spending, but will also require the replacement of transformers with PCB levels above the
 3 50 ppm threshold. Based on previous testing results for PCB content, about 10% of those
 4 transformers tested (pre 1982) will require replacement at an average capital cost of about
 5 \$4 million per year. These costs are not included in any 2008 capital programs.

6
 7 **2.2.4 Other Services**

8
 9 Lines sustaining OM&A also covers a number of other miscellaneous services listed in
 10 Table 7.

11
 12 **Table 7**
 13 **Sustaining OM&A – Other Services**
 14 **(\$ Millions)**

15

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Customer Inquiries (d)	2.8	3.8	3.2	3.8	3.5
Investigations & Data Collection (d)	1.6	2.4	1.0	1.2	1.0
Miscellaneous Services	2.9	3.2	3.2	6.2	4.9
Total	7.3	9.4	7.4	11.2	9.4

16 (d) – indicates this is a demand program

17
 18 Customer Inquiries provides for the work required to respond to inquiries concerning
 19 customer services, bills, location of Hydro One Distribution assets on customer
 20 properties, planned and unplanned outages, power quality complaints, clarifications on
 21 policies, etc. Approximately 9,000 customer inquiries are processed annually.

22
 23 Investigations and Data Collection captures the work required to respond to requests for
 24 detailed information on distributing station and line assets. This program addresses
 25 information requirements related to the condition of the assets, public and employee

1 safety hazards, unacceptable system performance, audit of joint use facilities and data
2 required to support response to customer reliability concerns.

3
4 Miscellaneous Services covers a number of activities including: payments to other LDCs
5 for pole rental where Hydro One Distribution wires are supported by other LDC's poles;
6 LDC switching requests; funds to collect and report data for a number of service quality
7 indicators to the Ontario Energy Board on an annual basis; miscellaneous engineering
8 and environmental support; Corporate Environmental Health and Safety activities.
9 Environmental Health and Safety includes activities required to meet legal obligations,
10 ensure a level of due diligence that is appropriate for Hydro One Distribution and assist
11 in meeting safety targets. Included in Environmental Health and Safety are costs for
12 technical and safety training, work method support, incident management, compliance
13 reviews, work place inspections, and public safety awareness.

14
15 Work on these programs requiring an appointment at a customer's residence or requiring
16 a written response to a customer inquiry contributes to Hydro One Distribution's
17 performance on the "Appointments" and "Written Response to Inquiries" service quality
18 indicators specified by the OEB in the Electricity Distribution Rate Handbook,
19 Sections 15.1.4 and 15.1.5, respectively.

20
21 The 2008 spending requirement for this program is \$9.4 million, and is based on historic
22 customer demand and forecasted workload. The 2008 spending is 17% greater than the
23 historic average. The increase over average historic expenditures is primarily attributed
24 to an increasing focus on Health and Safety consistent with the company's strategic
25 goals.

26

1 **2.3 Metering**

2
3 Hydro One Distribution currently owns and maintains revenue meters of three main types
4 as follows:

- 5
- 6 • Retail Meters
 - 7 ○ About 1.2 million meters measuring energy consumption for residential and other
 - 8 customers whose average monthly demand is 50 kW or less.
 - 9 ○ About 7,300 electronic demand meters for smaller business customers with an
 - 10 average monthly electricity demand of greater than 50 kW.
 - 11 ○ About 1,300 interval meters for existing business customers whose demand
 - 12 exceeds 1,000 kW, recently connected customers whose demand exceeds 200 kW
 - 13 and customers below the threshold who have requested interval meters.
 - 14 • Smart Meters – Advanced metering devices and components of a metering system
 - 15 with functionality to bill customers on the basis of Time of Use (TOU) pricing.
 - 16 These will replace the existing 1.2 million energy meters by 2010.
 - 17 • Wholesale revenue meters used to settle the purchase of energy where the point of
 - 18 supply is directly connected to the IESO-controlled grid. A number of these meters
 - 19 are transitioning from Transmission to Distribution as noted below.

20
21 OM&A expenditures are required to ensure that all metering installations are maintained
22 properly, replaced when needed and verified in accordance with requirements of the
23 Electricity and Gas Inspection Act (E&GIA), Measurement Canada and the market rules.
24 In 2007 and 2008, metering sustaining OM&A expenditures are significantly affected by
25 the full deployment of the Smart Meter Program.

26
27 The funding for distribution revenue metering for 2008, and spending levels for the
28 bridge and historic years, is provided in Table 8 below.

Table 8
Metering OM&A
(\$ Millions)

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Customer Retail Meters	8.0	7.2	8.1	8.5	6.0
Smart Meters	-	2.4	4.9	6.2	9.7
Wholesale Revenue Meters	0.2	0.7	1.0	1.0	1.9
Total	8.2	10.3	14.0	15.7	17.6

2.3.1 Customer Retail Revenue Meters

Of Hydro One's existing 1.2 million retail meters, about 500 must be removed and replaced each year due to random failures, damage or obsolescence. In addition, under the E&GIA and regulations, all revenue meters must be routinely inspected, maintained and their accuracy verified by an accredited meter verifier. A statistically derived sample group of about 2,000 meters is tested annually, according to a sampling program monitored and regulated by Measurement Canada. Normally the samples pass, but a failure of a sample group entails replacement of all meters in that group which could require the replacement of 10,000 meters.

Meters that do not qualify to be sampled, such as commercial or industrial meters, require all seal meters to be verified. These verification averages between 8,000 to 12,000 meters per year.

To avoid inefficiencies which would result from the testing and verification of installed meters, followed by their near term replacement by smart meters, Hydro One Distribution received a dispensation in 2006 from Measurement Canada which allows meters coming due for verification from 2008 through 2010 to remain in place without verification. This

1 dispensation applies only to meters that have been demonstrated to retain a high level of
2 accuracy, comprising about 75% of the sample group population. The remainder will
3 continue to be tested and re-verified annually as planned.

4
5 For its demand and interval-metered customers, Hydro One Distribution is currently
6 examining smart meter options with appropriate communication platforms and once these
7 are determined, will develop and implement smart metering plans. The current meters,
8 however, will continue to need expenditures focused on routine maintenance, re-sealing,
9 verification, trouble calls and other sustaining activities.

10
11 The 2008 spending for this program is \$6.0 million, \$2.5 million less than for 2007. This
12 funding level is based on an assessment of historic costs and projected meter
13 verifications, while accounting for estimated savings of \$2.8 million from reduced meter
14 testing and replacement due to the Measurement Canada dispensation. The 2008
15 spending is 22% less when compared to average historic expenditures. The reduction is
16 again attributed to the Measurement Canada dispensation.

17 18 2.3.2 Smart Meters

19
20 This section of the evidence describes the OM&A expenditures related to Hydro One
21 Distribution's Smart Meter Program. Capital requirements are described at Exhibit D1,
22 Tab 3, Schedule 2 and at Exhibit D2, Tab2, Schedule 3, S19. Distribution Regulatory
23 Asset account information associated with the Smart Meter Program is filed at Exhibit
24 F1, Tab 1, Schedule 1

25
26 In 2007, in line with legislative and regulatory requirements, Hydro One Distribution
27 began full implementation of its Smart Metering Program, including smart meter
28 deployment, communication network "build-out," and customer information system

1 (CIS) and associated process re-engineering, to enable it to support TOU and Regulated
2 Price Plan (RPP) implementation.

3
4 These installations require on-going sustaining investments, with expenditures of \$9.7
5 million in 2008. This spending requirement reflects the continuing deployment of smart
6 meters through Hydro One Distribution's service territory, toward its target of about 1.2
7 million meter installations by 2010. The related sustaining activities and costs
8 encompass both minimum and incremental functionality work:

- 9
10 • Activities associated with the government's regulations concerning minimum
11 functionality, which account for \$6.2 and \$5.8 million in 2007 and 2008 respectively,
12 include the following work:

- 13
14 • maintaining and operating hardware, software and software licenses
15 associated with the advanced metering control computer (AMCC);
16 • telecommunication charges associated with operating the local area
17 networks (LANs) and wide area network (WAN); and,
18 • maintaining and operating smart meters and the network devices that have
19 been placed into service.

- 20
21 • Incremental functionality activities associated with effective use of the smart meters
22 to provide time-differentiated billing to customers and provide Hydro One the ability
23 to leverage its Advanced Metering Infrastructure (AMI) system for other business
24 benefits, which account for \$0.0 and \$3.9 million in 2007 and 2008 respectively,
25 include the following work:

- 26
27 • managing, developing and implementing business process re-design (e.g.
28 manual to automated meter reading for on-cycle and off-cycle reads),

- 1 change management (including staff training) and customer
2 communication related work;
- 3 • responding to a higher number of customer inquiries as a result of pre- and
4 post-installation of smart meters on customer premises; and,
 - 5 • Maintaining the changes required to the CIS system (new processes,
6 workflow and tariffs) and the systems and interfaces necessary to integrate
7 to the AMCC and the IESO's meter data management and meter data
8 repository (MDM/R).
- 9

10 The 2008 expenditure level of \$9.7 million is about \$3.5 million higher than for 2007,
11 reflecting higher costs for on-going IT-related and meter maintenance. Spending on
12 smart meter program contributes to lower costs in other program areas. In addition to the
13 estimated savings of \$2.8 million in customer retail meter maintenance costs resulting
14 from reduced meter testing and replacement due to the Measurement Canada
15 dispensation, as discussed in Section 2.3.1 of this exhibit, there are also estimated savings
16 of \$1.4 million in 2008 as a result of reduction in the number of manual meter reads
17 related to the smart meter program, as discussed in Section 2.1.2 of Exhibit C1, Tab 2,
18 Schedule 5.

19
20 A fuller description of the Smart Meter Program is provided in Exhibit D1, Tab 3,
21 Schedule 2 and in the IJD in Exhibit D2, Tab 2, Schedule 3.

22
23
24 **2.3.3 Wholesale Revenue Meters**

25
26 Since 2003, in accordance with market rules, accountability for legacy wholesale revenue
27 meters (WRMs) owned by Hydro One Transmission, but used to settle Hydro One
28 Distribution purchases from the IESO-administered market, have been transitioning to

1 Hydro One Distribution. By the end of 2008, Hydro One Distribution will have assumed
2 accountability for a projected 375 WRMs.

3
4 As Hydro One Distribution is an IESO-registered meter service provider it will provide
5 all servicing for its WRMs, i.e. preventative maintenance, meter re-sealing and
6 verification, response to problems, corrective services and IESO registration. Funding for
7 this program includes these services and is required to ensure accurate wholesale billing
8 by the IESO, and to comply with the market rules and Measurement Canada regulations.

9
10 The 2008 spending for this program is \$1.9 million and is based on known costs and
11 volumes. The 2008 spending is greater than the bridge year and greater than historic
12 expenditures as the number of meters to maintain has gradually increased due to the
13 transition of the WRMs from Hydro One Transmission to distribution as required by the
14 market rules.

15 16 **2.4 Vegetation Management**

17
18 The Vegetation Management program manages clearances to energized equipment to
19 maintain an acceptable and sustainable level of reliability; manage safety hazards that
20 trees in proximity to energized lines pose, manage plant species on the right of way floor
21 to permit worker access for maintenance and restoration of power, and minimize
22 environmental, ecological and social impacts.

23
24 There are approximately 101,000 km of lines on rights-of-way, with most requiring tree
25 trimming or removal, and brush (undergrowth) control. Tree growing conditions vary
26 throughout Ontario, which contains three forestry zones. The predominate region is the
27 temperate hardwood forests which includes areas of the south, east and as far north as
28 Wawa & New Liskeard. The other two regions include the deciduous forests of

1 southwestern Ontario and the boreal forests of parts of northern Ontario. Tree species
 2 indigenous to the southern part of the province, and better growing conditions usually
 3 results in more frequent maintenance cycles in the south than in the north.

4 Vegetation management activities include line clearing comprising of tree removal and
 5 trimming, brush control, customer notification, vegetation asset condition assessment,
 6 and unplanned maintenance in response to reliability and customer issues as required.
 7 The annual program is compiled using the following inputs: vegetation condition data,
 8 tree clearances to energized facilities, and recent reliability data and customer issues.

9
 10 Vegetation Management work is divided into 5 programs with proposed funding for 2008
 11 along with spending levels for the bridge and historic years provided in Table 9 below.

12
 13 **Table 9**
 14 **Vegetation Management**
 15 **(\$ Millions)**
 16

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Unplanned Maintenance (d)	6.2	5.3	6.1	6.9	6.0
Customer Notification	6.9	6.8	6.8	6.5	7.9
Asset Condition Assessment	0.5	0.2	0.5	0.5	0.5
Line Clearing	55.6	52.9	50.6	74.1	76.8
Brush Control	19.6	21.1	25.2	26.9	28.2
Total	88.9	86.4	89.1	115.0	119.4

17 (d) – indicates this is a demand program

18
 19 The 2008 spending on the vegetation management program is \$119.4 million, which is
 20 about 35% greater than average historic expenditures. The reason for the increase is
 21 primarily attributed to increase levels of accomplishment in line clearing (accomplishment
 22 increased by 35%) and brush control (accomplishment increased by 25%), for the reasons
 23 discussed below.

1
2 Vegetation management is the largest program managed by Hydro One Distribution and
3 has the greatest impact on system reliability. As noted in Section 6 of Exhibit A, Tab 3,
4 Schedule 1, tree-related contacts accounted for 57% of SAIDI and 28% of SAIFI between
5 2003 and 2006, and the negative impact of trees during storm events were especially
6 acute. As such, vegetation management presents the greatest opportunity to improve
7 reliability.

8
9 Hydro One Distribution proposes to increase spending in a prudent and gradual manner
10 for maintaining vegetation on its rights-of-way, taking into account the availability of
11 resources.

12
13 The need for increasing the accomplishments in line clearing was highlighted on page 31
14 of Exhibit C1, Tab 2, Schedule 2 of the 2006 Distribution Rates application under
15 proceeding RP-2005-0020/EB-2005-0378, and is repeated below:

16
17 “Hydro One Distribution’s goal is to continue to increase accomplishments for line
18 clearing with an objective to reach an optimum cycle from a reliability perspective of
19 eight years by 2008. Annual accomplishment would have to increase from the current
20 10,360 km to 12,500 km.”

21
22 The proposed 2008 accomplishments for vegetation management is 12,500 km of rights-
23 of-way line clearing and 12,500 km for brush control, which maintains Hydro One
24 Distribution’s strategy to gradually improve the condition of its rights-of-way, as
25 articulated in 2006.

26
27 Accomplishments over the 2004-2006 period have averaged 9,300 km for line clearing
28 and about 10,000 km for brush control. The accomplishments during this period were

1 below plan because the 2005 program was impacted by a labour disruption and the 2006
2 program was affected by the redirection of resources to respond to the unusually high
3 number of storms in that year. Accomplishments in 2007 were 12,211 km for line
4 clearing, which is above historic values and partially offsets the shortfalls during the
5 previous two years.

6

7 Details concerning each of the components that make up the vegetation management
8 program are discussed in the sections below and additional information on vegetation
9 management is also provided as part of the ACA discussion in Exhibit D1, Tab 2,
10 Schedule 1.

11

12 2.4.1 Unplanned Vegetation Management

13

14 All of the 101,000 km of rights of way is situated in the public domain and the
15 management of vegetation on and adjacent to the rights of way is of interest to many of
16 the 1.2 million Hydro One Distribution customers, property owners, municipalities, and
17 government ministries. Each year these groups identify vegetation issues that need to be
18 addressed during the current year in order to ensure customer reliability and public safety.
19 Unplanned work initiated by the public includes the removal of hazard trees that may fall
20 into a line and restoring clearances to energized equipment at locations that are not within
21 the current years planned program.

22

23 A number of the reliability issues that develop each year need to be addressed during the
24 current year in an off-cycle manner. A portion of the unplanned funding is allocated to
25 address unforeseen system reliability problems cause by tree or underbrush growth.

26

27 The 2008 spending requirement for this program is \$6 million which is similar to historic
28 expenditures. This is a demand program that is needed to respond to customer and

1 reliability issues during the current year, as well as responding to and managing safety
2 risks to the public.

3
4 2.4.2 Customer Notification

5
6 Prior to commencement of line clearing and brush control, customer approval is acquired
7 to gain access onto private property and to resolve issues concerning tree removal,
8 trimming and control of brush, as well as obtain input from customers concerning any
9 property restrictions and environment concerns. During this phase of the work, job
10 planning and project layouts are completed, a detail scope of work is prepared and
11 approvals are obtained from property owners, Municipalities, Ministry of Natural
12 Resources, etc. These planning and project management activities are essential for Hydro
13 One Distribution to complete its annual vegetation management work programs, (i.e., line
14 clearing and brush control) with minimum disruptions, and to manage customer and
15 property owner concerns in a responsible and proactive manner.

16
17 The 2008 spending requirement for this program is \$7.9 million. The amount is
18 approximately 15% above historic expenditures. The primary reason for the increase is
19 higher volume of notification associated with increases in line clearing and brush control
20 program for 2008.

21
22 Reductions in this program will see an increase in customer complaints, incomplete
23 approvals to enter properties to carry out work, and expected disruptions to planned work
24 as a result of property owner intervention. As well, with disruptions in the flow of
25 planned work, one can expect unit costs to increase with the larger line clearing and brush
26 control programs.

27

1 2.4.3 Asset Condition Assessment

2
3 Asset condition assessment is an integral aspect of the asset management approach and is
4 generally completed about 2 years prior to the time projected for line clearing.
5 Information obtained includes vegetation height, tree and brush densities and clearances
6 to conductors, and this information is then used to prioritize and schedule work. For
7 further details concerning the condition of vegetation on Hydro One Distribution's rights
8 of way refer to Exhibit D1, Tab 2, Schedule 1.

9
10 The 2008 spending requirement for this program is \$0.5 million, and is consistent with
11 historic expenditures.

12
13 Reductions in this program will result in planning inefficiencies that will seriously reduce
14 the effectiveness of the larger brush control and line clearing programs.

15
16 2.4.4 Line Clearing.

17
18 Line clearing includes: removal of damaged or diseased trees along the edge and on the
19 rights-of-way that pose a threat of falling into a line; and tree trimming required to
20 maintain clearances to energized facilities, thereby reducing the likelihood of power
21 interruptions. On average there are slightly more than 50 trees per kilometer that need to
22 be removed or trimmed on the distribution system, and during 2006 Hydro One
23 Distribution removed and trimmed about 480,000 trees in total. This program maintains
24 tree clearances and reduces risks of danger trees, and as such has a great potential to
25 improve reliability.

26
27 For 2008, Hydro One Distribution is proposing an accomplishment of 12,500 km. This
28 volume of work is needed to reduce the high negative impacts vegetation have on

1 reliability of the distribution system under more normal conditions and during storm
 2 events. The impact that vegetation has on reliability can be seen in Table 10 below.

3
 4 **Table 10: Total SAIDI and Vegetation Contribution**

5

Year	All Interruptions (hrs)			Force Majeure Events (hrs)		
	Total	Tree Contribution	Tree %	Total	Tree Contribution	Tree %
2003	15.1	8.9	59%	7.1	6.0	84%
2004	6.9	2.0	29%	0.4	0.2	39%
2005	14.5	7.9	54%	6.5	5.4	83%
2006	28.4	18.1	64%	21.3	16.2	76%
Total	65.0	36.9	57%	35.3	27.8	78%

6
 7 The impacts of trees on Hydro One Distribution's system is significant. Considering all
 8 interruptions, trees on average account for about 57% of SAIDI and during *force majeure*
 9 events the impacts increase to an average of 78% with a high of 84%. The planned 35%
 10 increase in the volume of work will target the rights-of-way contributing most to
 11 unreliability on Hydro One Distribution's system, and should make appreciable
 12 improvements over time to the benefit of our customers. Hydro One believes its plan
 13 demonstrates good utility practice and addresses customer reliability. Hydro One
 14 Distribution monitors the performance of its distribution system on a continual basis and
 15 once the 12,500 km accomplishment is achieved, the need for further improvements will
 16 be re-assessed. This topic is further discussed as part of the ACA in Exhibit D1, Tab 2,
 17 Schedule 1.

18
 19 The 2008 spending requirement for this program is \$76.8 million. The increase over
 20 historic years is about 45%, primarily attributed to an increase in volume of about 35%.

21
 22 Reduced funding in this program will allow the current tenuous situation to persist
 23 resulting in a highly variable reliability performance, as can be seen above, and an
 24 increase in safety hazards associated with vegetation in proximity to energized line

1 facilities. Reductions in this program also increase the life cycle costs for vegetation
2 management and thereby create future inefficiencies.

3
4 Evidence of the effectiveness of line clearing can be seen in the performance
5 improvements achieved with feeders cleared during 2005. Table 11 below highlights the
6 aggregate percentage improvements when comparing reliability in 2003 and 2004 (i.e.
7 years prior to clearing) to that experienced in 2006 (year after clearing in 2005).

8
9 **Table 11**
10 **2006 Reliability Improvements Attributed to Line Clearing in 2005**

11

Measure	Improvement *
Average Customer Interruptions	33%
Average Customer Hours of Interruption	41%

12 * Excludes impact of force majeure events

13
14 As can be seen from the results in Table 11, customers connected to the lines cleared
15 during 2005 received significant benefits, as their average outage durations were reduced
16 by 41% and the number of customer interruptions were reduced by 33%. These results
17 highlight the large improvements that can be achieved with more frequent line clearing.

18
19 **2.4.5 Brush Control**

20
21 Brush control involves the management of specific plant types on the right-of-way floor
22 to minimize the presence of trees that can grow tall enough to contact the overhead lines.
23 This program also provides a right-of-way that will facilitate access of equipment,
24 inspection and maintenance activities, and emergency response.

1 Costs to control brush increases significantly once the height exceeds 3 meters and can
2 more than double in cost if the brush is allowed to grow within the electrical limits of
3 approach. Mechanical brush control methods and the requirement to use work
4 procedures to ensure worker safety are the primary reason for the increase in cost. These
5 methods are increasingly required as a result of community resistance to herbicide use.
6 The level of accomplishment proposed for 2008 is the same as for line clearing and
7 involves clearing brush on 12,500 km of rights-of-way.

8

9 The 2008 spending requirement for this program is \$28.2 million which is about 28%
10 greater than historic expenditures. This increase is primarily attributed to an increase in
11 volume of about 25%.

12

13 Reduced funding in this program will increase unit cost for brush control and the overall
14 life cycle cost. Reduced brush control also makes it more difficult to access the rights-of-
15 way, which hampers emergency restoration and consequently increases outage durations.

16