

1 **OPERATIONS OM&A**

2  
3 **1.0 INTRODUCTION**

4  
5 Operations OM&A investments are required to manage the day to day flow of electricity  
6 within Hydro One Distribution's system. The Operations function coordinates and  
7 dispatches crews to restore power as required, schedules and coordinates planned outages  
8 and provides customer notifications, and monitors and reports on the performance of the  
9 distribution electricity system.

10  
11 **2.0 DISCUSSION**

12  
13 Distribution System Operations activities are carried out centrally at the Ontario Grid  
14 Control Centre (OGCC) using modern technology and systems. OGCC is a shared  
15 facility which allows central operations of the distribution and transmission systems and  
16 is backed up by facilities located at a separate site.

17  
18 The cost assigned to Hydro One Distribution for Distribution Operations at OGCC is  
19 based on the "Rudden" cost allocation study discussed in Exhibit C1, Tab 5, Schedule 1.

20  
21 Operating control of the distribution and transmission systems was consolidated at the  
22 OGCC during 2003 and 2004 through the combination of Hydro One Distribution's  
23 Central Operations with Hydro One Transmission's real-time operation of the  
24 transmission system. This consolidation enabled several ongoing efficiency and  
25 effectiveness benefits:

- 1 • Reduced staffing costs through allocation of staff between transmission and  
2 distribution operations, taking advantage of the general non-coincidence of workload  
3 between these two functions.
- 4 • Improved effectiveness through real-time communication and coordination of  
5 priorities between transmission restoration and distribution restoration.
- 6 • Reduced staff development costs through sharing of training programs and facilities.
- 7 • Reduced support and systems costs through sharing of common infrastructure.

8

9 A suite of systems and tools is used to aid in the monitoring, planning, and maintenance  
10 of the distribution system. Hydro One Distribution has been proactive in assessing and  
11 implementing technologies to improve the operation of the distribution system and the  
12 consolidation to one centre further facilitates assessment and implementation of these  
13 systems.

14

15 The primary systems in place are as follows:

16

- 17 • The *Distribution Operating Maps and Distribution Station Diagrams* are the legacy  
18 tools that continue to be used by field crews and, to a lesser extent, by OGCC to  
19 provide the picture and detailed information showing the configuration of the  
20 distribution system, and to ensure the safe isolation of equipment.
- 21 • The *Network Management System (NMS)* is the supervisory control and data  
22 acquisition (SCADA) tool. It provides the real-time voltage and loading on the sub-  
23 transmission circuits at the transformer station as well as monitoring and control of  
24 the status of the breakers feeding those circuits.
- 25 • The *Outage Response Management System (ORMS)* is the distribution outage  
26 management tool that automatically analyses no-power calls received at the customer  
27 call centre and pinpoints the location of outages, identifies all affected customers and  
28 facilitates optimal dispatch of field crews.

- 1 • The ***Interactive Voice Response (IVR)*** system is the tool used to advise customers of  
2 the status of an outage affecting them. The IVR is set automatically by the ORMS  
3 after it has determined all affected customers for an outage location. This  
4 significantly reduces the call volumes that agents need to handle at the Customer Call  
5 Centre.
- 6 • The ***Provincial Mobile Radio System*** is the means by which both the OGCC and the  
7 field operations centres maintain continuous contact with field crews. It is designed to  
8 be reliable in the event of a widespread blackout and at all remote locations where  
9 field crews would be dispatched.
- 10 • The ***OGCC Integrated Voice System*** which allows Central Operations to effectively  
11 manage voice communications using multiple paths of communication, such as the  
12 public telephone network, public cell phone network, Hydro One's Distribution's  
13 provincial mobile radio system and mobile satellite telephone system.
- 14 • ***The OGCC Emergency Response Services Information System*** which provides  
15 verified up-to-date contact numbers for all emergency response services (e.g. police,  
16 fire, ambulance, ministry of environment, gas utilities, etc.) across the province keyed  
17 in a Geographical Information System to their service territories.

18  
19 The OGCC is the operating authority for Hydro One Distribution's 44/27/13 kV systems  
20 (i.e., from the transformer supply station to the distribution supply station). During real-  
21 time operations, the OGCC monitors the distribution system at the transformer supply  
22 stations for correct voltage levels, power quality, equipment loading, and equipment  
23 alarms.

24  
25 Distribution Operations is divided into two programs, Operations and Operating Support,  
26 with the funding for 2008 and the spending levels for the bridge and historic years  
27 provided in Table 1 below.

**Table 1**  
**Operations OM&A**  
**(\$ Millions)**

Description	Historic			Bridge	Test
	2004	2005	2006	2007	2008
Operations	13.0	8.1	10.8	8.5	9.5
Operating Support	3.3	3.2	4.1	4.1	3.9
<b>Total</b>	<b>16.3</b>	<b>11.2</b>	<b>14.9</b>	<b>12.6</b>	<b>13.4</b>

## 2.1 Operations

The Operations program funds the real time distribution operating functions, training of staff, and ensuring that the various systems and tools are kept current and functioning as required.

Specific functions include managing planned and unplanned outages, coordinating emergency response and monitoring system performance. These activities are described in greater detail below.

2.1.1 Managing and implementing planned outages: all outages on the distribution system are managed at the OGCC. Planned outages are about 10% to 15% of all Hydro One Distribution customer outage durations. Applications for planned outages are coordinated to capture efficiencies and mitigate impacts on customers. This involves:

- Assessing all equipment involved in the outage to determine appropriate limits and control actions.
- Identifying and notifying customers of upcoming outages using means such as auto-dialer, phone, fax, newspapers, flyers, radio, and door to door visits.

- 1 • Addressing customer concerns regarding outages by moving, where possible, the  
2 outage times/date, transferring customers to other distribution sources, or providing a  
3 back up source.
- 4 • Applying the Utility Work Protection Code to all outages to ensure all safety barriers  
5 are established.

6

7 2.1.2 Responding to and managing unplanned outages: equipment failures,  
8 tree/vegetation contact, road accidents, severe weather, and lightning result in  
9 interruptions to the distribution system and cause unplanned outages. Unplanned outages  
10 account for about 85% of Hydro One Distribution total customer outage durations. The  
11 cost of wide-area rural telecommunication and monitoring and control equipment has  
12 prohibited the use of real-time monitoring and remote controls on Hydro One  
13 Distribution's system. Hydro One Distribution accordingly relies on "no-power" phone  
14 calls from customers to detect and locate distribution system outages. All restoration  
15 measures depend on field crews responding to the location of the outage. Once the  
16 location of the faulted equipment is determined, the OGCC dispatches repair crews. The  
17 OGCC tracks all crews that have been dispatched to effect repairs and is able to manage  
18 response times by following repair status. Affected customers are kept advised of the  
19 interruption status through the use of an interactive voice response (IVR) system, which  
20 informs callers that the problem is known and that crews have been dispatched, as well as  
21 providing an estimated time of power restoration if known.

22

23 2.1.3 Emergency response coordination: when the Hydro One Distribution system  
24 experiences widespread interruptions due to weather impacts, an emergency response  
25 system is implemented. The level of response varies according to the area(s) and number  
26 of customers affected and the expected duration of the problem. The OGCC will  
27 dispatch crews normally until a decision is made, based on volume of power-off calls, to  
28 move to "Field Operations Center Dispatch" mode. In this mode, customer power-off

1 calls are spread out over the field operations centers to allow supervisors to dispatch  
2 crews at a more local level and manage their resources efficiently. If the emergency is  
3 significantly widespread, incident command centers (ICCs) and forward command posts  
4 (FCPs) are established to centralize a command structure to address resources, equipment  
5 needs, and restoration activities. The OGCC provides media notifications to keep Hydro  
6 One Distribution customers advised and it provides municipalities and agencies with  
7 outage progress updates.

8  
9 Following the 1998 Ice Storm and in preparation for Y2K, Hydro One Distribution  
10 developed a formal Emergency Preparedness Program (EPP). The EPP consists of  
11 emergency response plans, procedures, designated facilities and a trained and tested  
12 emergency response organization. Maintaining an effective and efficient Emergency  
13 Preparedness Program is a market rule requirement.

14  
15 2.1.4 Acquire system performance information, internal reporting and performance  
16 monitoring: Reliability information is needed to support sustainment and development  
17 decisions, respond to emerging problems, and report on system performance to the  
18 Ontario Energy Board, customers and other stakeholders. Data required to calculate the  
19 standard reliability indices such as SAIDI (System Average Interruption Duration Index),  
20 SAIFI (System Average Interruption Frequency Index), and CAIDI (Customer Average  
21 Interruption Duration Index) is acquired at the OGCC. Outage inquiries from customers  
22 are reviewed and the data extracted from the various systems to advise customers what  
23 has been done as well as establish additional plans.

24  
25 2.1.5 Summary: The 2008 spending requirement for this program is \$9.5 million which  
26 is within the range of historic expenditures. These costs have fluctuated somewhat over  
27 the years, due to several factors. 2004 was the last year for higher expenditures relating  
28 to the consolidation of transmission and distribution operations at the OGCC. Lower

1 demand in 2005 resulted in spending which was slightly lower than usual. Operations  
2 work and related costs were higher in 2006, as it was a higher than normal year for storm  
3 activity thereby requiring added efforts to manage restorations.

4  
5 Distribution operations is an essential activity for the safe and reliable supply of power.  
6 Any funding reductions in this program would negatively impact customer reliability,  
7 efficiency of power restoration, and the safe operation of the distribution system.

## 8 9 **2.2 Operating Support**

10  
11 As highlighted under the Discussion portion of this Schedule, Operations relies on a  
12 number of systems and tools to manage and operate the distribution system, as well as a  
13 Back-up Operating Facility.

14  
15 Operating Support funds ongoing costs that include system configuration updates for  
16 ORMS, updates to the distribution operating maps and station diagrams, emergency  
17 preparedness, and the allocated portion of the maintenance and upkeep of operating  
18 facilities at the OGCC and the back-up operating facility. The historical fluctuation in  
19 funding for this program is due to variations in volume of updates to the distribution  
20 operating maps and station diagrams.

21  
22 The OGCC came into service in 2004 and the Back-up Operating Centre came into full  
23 service in 2005. Funding needed for the Distribution allocation of the cost to sustain  
24 these facilities became part of this program in 2004.

25  
26 The 2008 spending requirement for this program is \$3.9M, which is within the range of  
27 historic expenditures with variations attributed to changes in volume of work associated  
28 with map and diagrams updates.

Filed: August 15, 2007

EB-2007-0681

Exhibit C1

Tab 2

Schedule 4

Page 8 of 8

1 Reduced funding for this program would result in deterioration in the performance of  
2 ORMS and control room facilities to unacceptable levels, reduction in the accuracy of  
3 operating maps (which increases the safety risk to workers), and non-compliance with  
4 emergency preparedness obligations.

5