Q. With regard to the report entitled 2005 Annual Return (Return 20a), there is reference to a business case to examine the feasibility of expanding the Automatic Meter Reading (AMR) program. Please provide an update on this project, and a copy of the business case and all supporting documentation.

A. Hydro has included in its 2007 Capital Budget a proposal to implement Automatic Meter Reading in the St. Anthony and Bay d'Espoir areas. Hydro's future plan is to continue implementation of AMR coincident with labour force attrition. A copy of the business case and all supporting documentation associated with the 2007 AMR Capital Budget Proposal is attached.

HYDRO
THE POWER OF COMMITMENT

Automatic Meter Reading
2007 Implementation Plan

Prepared by: **Al Ballard**
June 12, 2006
Reviewed by: **Robert Henderson**
Manager – System Operations & Customer Services
Newfoundland and Labrador Hydro

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1. EXECUTIVE SUMMARY

This business case focuses on the cost feasibility and other related benefits of the Automated Meter Reading (AMR) Power line Carrier One-way System compared against the current Radix Handheld System

Two service areas were selected for cost comparison of the AMR Power line Carrier One-Way System and the Radix handheld system based on implementation in 2007. The two areas selected, St. Anthony and Bay D'Espoir, are full-time meter reader routes that are currently vacant and being filled by temporary staff. For comparison the Hunt Technologies Turtle System, which was used for the pilot project, was compared to the Radix handheld system. The results showed that the AMR system can be completed for both service areas for approximately $174 per endpoint with a 8-year payback and will reduce operating costs in these areas from $35 per meter to $9 per meter in the first full year of operation. This reduction in annual operating costs, coincidentally, was the average determined for the full system as well. These numbers are based on a 1-year implementation period that will include the purchase of equipment and completion of installation and commissioning of both systems.

In addition to cost feasibility, there are valuable customer service improvements to be realized with an AMR One Way System These include, elimination of estimated reads and reading errors, consolidated billing, availability of daily consumption patterns, electronic final reads for name changes, virtual disconnect and limited outage and restoration management.

The AMR One-Way System also has an option to include end of the line voltage monitors, which collect and report voltage data on a regular basis similar to the meter data. These monitors can be installed permanently on each feeder and will provide valuable study data to our Planning Engineers on a regular basis for assessing feeder design and load balancing.

The implementation of AMR Technology will affect all personnel directly associated with the meter reading process. Currently we have a freeze on hiring new meter readers that has resulted in three vacant full-time read areas, St. Anthony, Bay D'Espoir and Daniel's Harbour. Temporary meter readers are now carrying out the duties in these areas.

In order to reduce severance related costs and enable employee's opportunities for retraining, Newfoundland and Labrador Hydro have selected to go with an area by area implementation through attrition rather than a system-wide implementation. A slower implementation may also allow opportunities for savings in implementation costs through prudent management of the project using internal labour rather than contractors.

2. INTRODUCTION

In 1998, Newfoundland and Labrador Hydro (Hydro) introduced electronic handheld meter reading units in all reading routes with 200 or more endpoints. These units allowed readings to be downloaded from the meter reader location to head office via telephone modem and then uploaded directly to the JDE Billing System. This eliminated the manual and very time-consuming process of recording readings and keying them into the Billing System.

Although the handheld system has improved customer service, it is still a very labour intensive process thus keeping the cost per meter read high; the biggest obstacle in controlling cost is the geographical area in which our customers reside. In 2001, a Meter Route Optimization Study was conducted resulting in successfully reducing costs by approximately 10% however due to the high labour cost required for meter reading opportunities for cost reduction are very limited. Hydro currently has 13 permanent full-time, 6 permanent part-time and 6 part-time meter reader positions. This excludes the isolated diesel systems where the meters are read by the Distribution System Representatives.

In 2004, when the Radix Corporation gave Hydro notice that they would not be supporting the current handheld system beyond December 2005, the timing was appropriate to research other cost saving options for the meter reading process. In a general review of the marketplace, Automatic Meter Reading (AMR) held an immediate attraction. AMR has been growing very popular with utilities in recent years and showed potential for significant cost savings. To mitigate any risk associated with bringing in a new technology before the December, 2005 date, the Radix System was upgraded. The upgrade was completed in January 2006 and the Radix FW500 units are now in use.

In assessing it's AMR options two power line carrier options were considered, the Power line Carrier Two-Way system and the Power line Carrier One-Way System. A cost assessment of both options showed the two-way system to be cost prohibitive. The main reason for this is that the two-way system required a costly substation setup at each delivery point to initiate two-way communications with the endpoints. Although the two-way system did have benefits Hydro's low endpoint per substation ratio made the cost per endpoint excessively high. In comparison, the one-way system was more suited to the remote and low density areas in which Hydro operates.

Hunt Technologies, a leader in AMR Technology and developer of the Turtle software system, was chosen as the vendor that Hydro would deal with in evaluating a possible AMR application in it's service areas. The Hunt System met the following requirements that Hydro were looking for:

- It was specifically designed for rural systems
- It was reasonably priced
- It made use of existing infrastructure via power line carrier technology

In 2003/2004, Customer Services undertook a pilot project on the St. Brendan's Diesel Distribution System to study the Hunt Turtle One-Way System. From November 2003, after fully implementing the AMR system in St. Brendan's, until October 2004, parallel billing runs were done with the current billing system. The success of these parallel-billing runs confirmed the integrity of Hunts AMR technology. The report on the St. Brendan's Pilot is available should it be required in conjunction with this Business Case.

The success of the AMR pilot project and further research into this technology, including discussions with Utilities, convinced Customer Services to recommend AMR Power line Carrier One–way technology as a replacement for its handheld system.

3.0 PROJECT DEFINITION

3.1 Purpose

The purpose of this business case is to compare the current Radix System to the AMR Power line Carrier One-Way System to identify the most practical and cost effective option for Hydro's meter reading process for the future. Hydro currently uses the Radix System for meter reading and interfacing with JDE. The Radix Handheld System currently used by Hydro requires a significant labour component, which results in a high per unit cost.

3.2 Objectives

- To identify the most practical and cost effective option
- To determine a cost and time table for implementation in the St. Anthony and Bay D'Espoir read areas.

3.3 Scope/Major Deliverables

This project will provide the following results:

- The identification of the most practical and cost effective meter reading option
- The purchase and implementation cost of this option
- A benefits assessment of this option compared to the current option, if different

3.4 Quality Specifications

The preferred meter reading option should provide the following benefits to customers:

- Least cost meter reading
- Eliminate meter reading errors
- Eliminate estimated readings
- Provide more detailed consumption reporting – daily & monthly
- Provide more flexible billing options (i.e. consolidated bills, customer selected bill dates)

3.5 Assumptions

For AMR Option:

- Under-glass transmitters will be available for polyphase meters
- Older meters that are unsuitable for retrofitting will be replaced as part of the normal replacement process

- For implementation, meters can be replaced at a minimum rate of 75 per day
- Data Receivers can be suitably installed in locations required to accommodate all endpoints
- A suitable communications option is available in locations required to accommodate all endpoints

3.6 Constraints

Constraints that may affect the selection and implementation of a new meter reading option are:

- Hydro's standard database is SQL

3.7 Prerequisites

The following are prerequisites of this project, however these requirements have been addressed in the Business Case:

- All meters are AMR compliant
- A robust interface is built with JDE
- A communication option is available at all Receiver points

4.0 STRATEGIC ALIGNMENT

4.1 Specific Strategic Initiatives

This initiative is in line with Hydro's Corporate Mission Statement, to provide electrical power and energy, on behalf of the people of the province, at the lowest cost consistent with reliable service. It also supports the following Hydro goal: Through operational excellence, to provide exceptional value to all consumers of our energy.

Expected outputs from this initiative are as follows:

- Least cost Meter Reading
- Automated meter reading process
- Improved Customer Services (i.e. less estimated reads, less reading errors)

4.2 Project Stakeholders

Project Stakeholders include the following:

- Management
- Customer Services Representatives
- Customer Account Processing Supervisor
- Meter Readers

- Metering Department
- Billing Clerk
- Rural Customers
- Field Operations (i.e. line crews)
- System Planning

4.3 IT Alignment

See Benefits Assessment Table in Appendix D1 and the associated notes in Appendix D2

5.0 APPROACHES

5.1 Identify Alternatives (See detail of each option in Appendix A)

Alternative 1 – Electronic Handheld System (Current Radix System)

Alternative 2 – Automatic Meter Reading Power Line Carrier One-Way System

5.2 Comparison of Alternatives

Alternative	**Radix**	**AMR One-Way**
Capital Cost	$16,129 (1)	$695,886
Est. Payback	None	
Reading Option	Manual (Handheld)	Automatic (Powerline Carrier)
JDE Compatible	Yes	Yes

(1) – Over life of study (15 years)

5.3 Recommended Alternative

Option 2 – Automatic Meter Reading Power Line Carrier One-Way System

6.0 RESOURCE REQUIREMENTS

6.1 Human Resource Requirements

Name	**Role**	**Responsibility**	**Time Commitment**	**Duration**	**Source (internal, external)**
Manager, Systems Operations &Customer Services	Project Sponsor	Insure objectives are met	Minimal	1 year	Internal

Customer Services Manager	Project Mgr.	Oversee project	Regular	1 year	Internal
Meter Reader(s) (Teams of 2)	Project Team Member	Oversee Meter Removals & Installations (Plug-in Only) & assist with wired-in meters	Regular	1 year	Internal
Metering Technician	Project Team Member	Oversee Meter Removals & Installations (Wired-in Only)	Regular	1 year	Internal
Business Analyst	Project Team Member	Oversee Intergration with JDE	As Required	1 year	Internal
IT Representative	Project Team Member	Oversee Intergration with JDE	As Required	1 year	Internal
Telecontrol Engineering	Project Team Manber	Oversee Substation Communications	As required	1 year	Internal
CSR	Administrative	Process Meter Change outs	Regular	1 year	Internal
Supplier Representative	Supplier	Assist with Implementation, including training & insure product is functioning properly	Regular	1 year	External
Shipping Services	Shipping	Deliver & return meters from retrofit services supplier	As Required	1 year	External
Retrofit Services	Retrofit Meters	Oversee retrofit, inspection and resealing of meters	As Required	1 year	External

6.2 Material/Equipment Procurement

- Purchase of the Automatic Meter Reading One-Way System will include:
  - Software & Licences
  - Standard Substation Receivers
  - Meter transmitters
  - External or underglass transmitters for polyphase meters
  - Setup and training
  - Telephone communications to head office from substations

  (Prices in this Business Case are based on the Hunt Technologies One-way System.)

- All required Revenue Electronic Meters will be purchased by Hydro's Meter Shop based on standard specifications and qualified suppliers.

- Meter Retrofit service will be purchased from a qualified supplier. (Olameter of Mississauga, Ontario provided Prices in this Business Case.)

- Application Server will be purchased by Hydro's IS&T Department to meet all internal requirements.

6.3 Information Requirements

Stakeholder	Report Requirements	Frequency
Customer Services	Endpoint Status Report	Daily
Customer Services/TRO	Endpoint Outage Report	As required
Customers	Consumption History	Daily/Monthly/ Yearly

7.0 COSTS AND BENEFITS (if appropriate)

7.1 Preliminary Budget/Cost Estimate

See Tables in Appendix B1 to B4

7.2 Benefits

See Benefits Assessment Table in Appendix D1 and the associated notes in Appendix D2

8.0 BUSINESS IMPACT

8.1 Changes to the Business Process

- Meters will be automatically read instead of manually read
- Manual uploading and downloading of meter route data will no longer be required
- Job functions of Radix CSR will change

8.2 New Staff Training Needs

- All CSRs will require training as AMR System Administrators
- Meter Department staff will require training on operation and maintenance of AMR equipment (i.e. transmitters, receivers)

8.3 Changes to Organizational Structure

The Customer Services Department Structure that currently oversees meter readers and meter reading will change as a result of reduced staffing & process changes.

8.4 Changes with Stakeholders

- Customer Services Representatives
  - Roles and Responsibilities with respect to processing meter readings for the St. Anthony and Bay D'Espoir Read Areas will change.
- Customer Account Processing Supervisor
  - Roles and responsibilities will be slightly reduced as a result of the reduction in meter reader positions.
- Meter Readers
  - Two meter reader positions will be eliminated, however, part-time staffing will be required to oversee activities such as collections and applications for service.
- Metering Department
  - The metering department will take on the new responsibility of maintaining and inspecting AMR equipped meters. This will require training but will have no effect on the current accreditation or staffing requirements.
- Rural Customers
  - Rural customers in the St. Anthony and Bay D'Espoir Read Areas will have added options for more convenient billing and they will no longer see estimated bills.
- System Planning
  - System Planning will have the option to receive voltage data on all distribution feeders in the St. Anthony and Bay D'Espoir Read Areas on a daily basis and will be able to conduct more frequent and more accurate load/voltage studies.

9.0 RISK MANAGEMENT

9.1 Major Overall Risks

Risk Event	Probability	Impact	Duration	Risk Strategy
Budget Variances	20%	Increased project costs	Purchase & implementation period – 1 year.	• Identify potential problem meters • Draw up an detailed implementation plan • Budget for exchange rate change

Hydro replaces JDE	10%	New interface program will be required	N/A	Interface program with new system would be written and tested prior to changeover
Impact of AMR on MV90 Software (Used by Operations for interrogating, collecting & processing revenue meters on bulk system)	10%	Duplication	N/A	• Identify if any duplication will exist • If yes, identify if integration can be accomplished
Human Resources impact of AMR	20%	Backlash from stakeholders (i.e. Rural communities)	N/A	Minimize effect on current staff where possible
Weather	25%	Delay in implementation	2 - 4 week delay	Time management

10.0 PRODUCTS AND DELIVERABLES

Deliverable, Event, Support...	Individual/Group Responsible	Team Owner
Hardware & Software	Customer Services / Supplier	Project Manager
Database Setup –HO	IT	Project Team Member
AMR/JDE Interface	Business Analyst / IT	Project Team Member
Meter Change outs	Meter Readers/Technicians	Project Manager
Shipping for Retrofit	Transport Company	Project Manager
Retrofitting	Meter Service Company	Project Manager
New Meter Purchases	Hydro Meter Shop	Project Team Member
Training	Supplier	Project Manager
Testing	Supplier / Project Team	Project Manager

11.0 IMPLEMENTATION STRATEGY

The implementation strategy to be used for each system will be as follows:

- Identification and acquisition of resources
- Review of all endpoints & cross-reference of in service assets to records
- Creation of detailed deployment plan
- Change out of meters
- Update JDE
- Register meters in AMR Software
- Activate system
- Run a manual vs. electronic reading test
- Transfer data to live billing system

12.0 RECOMMENDATIONS

After detailed assessment of the current Handheld System verus the AMR Power line Carrier One-Way System, the recommended option is the AMR Power line Carrier One-Way System . This decision was based on the following criteria:

- Cost
- Maximum benefits for least cost
- Geographical Considerations
- Timing of Implementation (i.e. vacant position)
- Improved technology

13.0 APPROVALS

PROJECT AGREEMENT APPROVAL FORM		
Project Name: I have reviewed the information contained in the Business Case dated_____ I agree to the baseline commitments specified in it.		
Rob Henderson, Project Sponsor	Signature	Date
Al Ballard, Project Manager	Signature	Date

14.0 APPENDICES

Appendix A
Overview of Meter Reading Options

Electronic Handheld System

The electronic handheld system consists of a software program, communications and charging cradles and handheld data units. This system intergrades manual reading with electronic billing by having the data keyed directly at the reading site. The process for the electronic handheld systems operates as follows:

- A predetermined billing cycle route is downloaded to a remote handheld unit via a telephone line and a communications and charging cradle (The download has to be initiated manually.)
- Following the downloaded route, a meter reader visits each meter site and reads and keys the current data.
- The handheld is returned to the communications and charging cradle and the new data is uploaded to a database at head office (The upload has to be initiated manually.)
- A report is run to verify the data. Any errors are corrected and the data is transferred to the billing system.

The electronic handheld system is currently used in Read Areas with greater than 200 endpoints.

Automatic Meter Reading One-Way System

The Automatic Meter Reading One-Way System consists of a software program, data receivers and endpoint transmitters. The data is transmitted electronically from the customer meter to a collection point and on to a database at head office without any manual intervention. The process for the automatic meter reading one-way system operates as follows:

- Data is transmitted continuously during the day from the customer meter to a local receiver unit via the Utility's power lines
- At a preset time each day the data is transferred from the receiver to the database at head office
- Reports are generated to verify the transmitted data and to identify abnormal variance
- The data is transferred to the billing system

Appendix B1
Budgetary Pricing Quotation
TS1 Full Deployment

Hunt Technologies, Inc.

Date: February 10, 2006
Quote Number:
Revised

Company Name	**Newfoundland Labrador Hydro**
Contact	**Al Ballard**
Address	**PO Box 12400**
City, State, Zip	**St. John's, NL A1B 4K7 Canada**
Phone Number	**709-737-1754**
Fax Number	**709-737-1902**
Email	Aballard@nlh.nf.ca

Description	Part Number	Unit Price	Quantity	Extended Price
Software				
Command Center (CC) Software Migration	LICN-00014	$ 3,500.00	1	$ 6,500.00
MAS License for Single Phase	LICN-00001	$ 500.00	1	$ 500.00
MAS License for Poly Phase	LICN-00002	$ 500.00	1	$ 500.00
MAS License for Centron	LICN-00003	$ 500.00	1	$ 500.00
	Sub Total			**$ 8,000.00**
Hardware				
CC License Fee (Endpoints over 5,000)	LICN-00020	$ 0.50	0	$ -
Standard Receiver (1,440 expands to 2,880)	0464-001	$ 4,250.00	4	$ 17,000.00
Standard Receiver (2,880 transmitters)	0344-001	$ 7,850.00	1	$ 7,850.00
Enhamnced eSPU Receiver	0344-xxx	$ 8,850.00	0	$ -
Single Phase Endpoints	0333-AAD, AAF, ABB, J	$ 55.00	3,472	$ 190,960.00
Centron Endpoints	Fasy-0584-0001, 0002	$ 60.00	530	$ 31,800.00
Polyphase TS1 kV2	0455-120C, 277C	$ 150.00	23	$ 3,450.00
End of Line Voltage Monitors	0366-001	$ 475.00	0	$ -
Opto Wand (Laptop Compatible)	0340-001	$ 200.00	1	$ 200.00
Programming Station	0347-001	$ 200.00	1	$ 200.00
Paint Pen Kit	FASY-0333-0001	$ 25.00	1	$ 25.00
User Manual	PUBS-0482-0105	$ -	1	$ -
	Sub Total		.	**$ 251,485.00**
Training and Implementation Services				
On-Site and Set-up at customer site by FSE	SERV-00001	$ 25,000.00	1	$ 25,000.00
WebEx Training (90 credits) see following tab	SERV-00027	$ 31.25	90	$ 2,812.50
				$ 27,812.50
Support and Service				
Annual Support Agreement	CONTRACT BILLING	$ 5,000.00		$ 5,000.00
>10,000 Endpoints installed on system		$ 0.30	0	$ -
				$ 5,000.00
Discounts				
Receiver Discount		$ (4,250.00)	0	$ -
Endpoint Discount		$ -	34935	$ -
	Discount Total			**$ -**
			Hunt Total Extended Price	**$ 287,297.50**

Appendix B2 Implementation Costs St. Anthony / Bay D'Espoir Systems		
Activity	**Note**	**Total Cost**
Meters		
Total Meters		3955
Meter Replacement Time (hrs)	1	422
Meter Reader Collector Charge Out Rate	2	$35.58
Meter Reader Charge Out Rate	3	$29.88
Salary per team of 2		$27,615
Labour for Wired in Meters (1 hour / meter)		$11,000
Labour for Installation of Receivers		$1,700
Salary - Team Leader (50% for 6 months)	4	$77,000
Salary - Junior CSR (25%)	4	$17,500
Vehicles (for 6 months)		$33,334
Engineering Design for Substations		$10,000
Retrofitting		
Retrofit - Outsourcing @$15 per meter	5	$52,080
Shipping for Outsourcing (estimated)		$3,000
JDE Interface		
Write, document, test and implement interface with JDE	6	$9,000
Total		**$242,229**
Cost/meter		$61.25

1. Based on 75 changeouts per day
2. Meter Reader/ Collector Rate as of Mar, 2004 times 2 for budgeting purposes
3. Meter Reader Rate (Group 4) as of Mar, 2004 times 2 for budgeting purposes
4. Based on 6 month at 2 times hourly rate for budgeting purposes
5. Based on $15 per meter quoted by Olameter
6. Based on 90 hours at $100 per hour

Appendix B3
TS1 St. Anthony / Bay D'Espoir Deployment 2007
Cost Estimate

Hunt Total Price (Budget estimate attached)		$287,298
Solid State Centron Meters (1)	$ 35.00	$0
Polyphase meters (23 meters)	$ 550.00	$12,650
Weatherproof Boxes for Receivers	$ 2,000.00	$4,000
Implementation Costs (details on next page)		$242,229
Communications Costs		$11,725
(receiver points to head office database)		
IT Costs		
Handheld Programmer with Pocket PC2003		$3,000
Application Server		$4,025
Exchange @ 20%		$57,460
NET DEPLOYMENT COST		$622,386
O/H, AFUDC & Contingency		$73,500
TOTAL DEPLOYMENT COST		**$695,886**

Taken from existing stock and/or include with annual meter purchase

Appendix B4
Automatic Meter Reading - 2007
Hunt TS1 vs Radix

Study Discount Rate: 8.40%

	Hunt - TS1 System							Radix System						NPV Comparison (Alt. 2 - Alt. 1)	
Year	Capital Costs	O&M Hunt	O&M Internal	Service Agreement	Total	Cost / Customer	CPW to 2007	Capital Costs	O&M Costs	Total	Cost / Customer	CPW to 2007			CPW to 2007
2006			27734	5000					132581						
2007	$ 695,886	0	28,288	5,100	729,275		729,275		135,233	135,233		135,233		$	(594,042)
2008		978	28,854	5,202	35,034	8.77	761,594		137,938	137,938	34.53	262,482		$	(499,112)
2009		998	29,489	5,316	35,803	8.96	792,063		140,972	140,972	35.29	382,452		$	(409,611)
2010		1,017	30,138	5,433	36,589	9.16	820,788		144,074	144,074	36.06	495,561		$	(325,227)
2011		1,038	30,801	5,553	37,391	9.36	847,868		147,243	147,243	36.86	602,201		$	(245,668)
2012		1,059	31,478	5,675	38,212	9.56	873,399		150,483	150,483	37.67	702,741		$	(170,658)
2013		1,080	32,187	5,803	39,069	9.78	897,479	7,533	153,868	161,401	40.40	802,220		$	(95,259)
2014		1,101	32,879	5,928	39,908	9.99	920,169		157,177	157,177	39.34	891,588	>>>	$	(28,581)
2015		1,123	33,569	6,052	40,744	10.20	941,541		160,477	160,477	40.17	975,762		$	34,221
2016		1,146	34,308	6,185	41,639	10.42	961,689		164,008	164,008	41.05	1,055,122		$	93,433
2017		1,169	35,097	6,327	42,593	10.66	980,702		167,780	167,780	42.00	1,130,016		$	149,315
2018		20,845	35,904	6,473	63,222	15.83	1,006,736		171,639	171,639	42.96	1,200,696		$	193,960
2019		1,216	36,730	6,622	44,567	11.16	1,023,666	8,596	175,587	184,183	46.10	1,270,664		$	246,997
2020		1,240	37,574	6,774	45,589	11.41	1,039,643		179,625	179,625	44.96	1,333,612		$	293,969
2021		1,265	38,420	6,927	46,612	11.67	1,054,712		183,667	183,667	45.97	1,392,989		$	338,278
2022		1,290	39,265	7,079	47,634	11.92	1,068,918		187,707	187,707	46.99	1,448,971		$	380,053

Note: Radix System Capital Costs based on a 6 year life
Cost / Customer based on 3,995 customers

Appendix C1
2006 BUDGET
CURRENT RADIX COSTS

ACCT	DESCRIPTION	BUDGET
6010	SALARIES	$76,156
6011	ALLOWANCES	$2,146
6020	OVERTIME	$0
6048	EMPLOYEE FUTURE BEN.	$7,616
6075	FRINGE BENEFITS	$11,423
6080	LAB. TRAVEL BENEFIT	$0
6085	GROUP INSURANCE	$2,285
6099	VACANCY ADJUSTMENT	
	TOTAL SALARY	$99,626
6105	SYSTEM EQUIP, MAINT	$11,900
6210	TELEPHONE & FAX	$1,241
6220	POSTAGE	$74
6245	MEMBERSHIPS & DUES	$0
6264	PROFESSIONAL SER.	$0
6505	TRAVEL EXPENSE	$0
6550	CONFERENCES	$0
6625	ENERGY MANAGEMENT	$0
6660	SUNDRY COST	$0
6725	SAFETY EQUIP. & SUPPL.	$1,200
6840	VEHICLE RENTAL	$6,300
6850	VEHICLE ALLOWANCE	$12,241
6910	COLLECTION FEES	$0
6920	BAD DEBT EXPENSE	$0
	TOTAL OPERATING	$32,955
	TOTAL EXPENSES	**$132,581**

APPENDIX C2
2006 BUDGET
NEW COSTS FOR AMR

ACCT	DESCRIPTION	BUDGET
6010	SALARIES	$14,804
6011	ALLOWANCES	$0
6020	OVERTIME	$0
6048	EMPLOYEE FUTURE BEN.	$1,480
6075	FRINGE BENEFITS	$2,221
6080	LAB. TRAVEL BENEFIT	$0
6085	GROUP INSURANCE	$444
6099	VACANCY ADJUSTMENT	
	TOTAL SALARY	$18,950
6105	SYSTEM EQUIP, MAINT	$0
6210	TELEPHONE & FAX	$0
6220	POSTAGE	$0
6245	MEMBERSHIPS & DUES	$0
6264	PROFESSIONAL SER.	$0
6505	TRAVEL EXPENSE	$0
6550	CONFERENCES	$0
6625	ENERGY MANAGEMENT	$0
6660	SUNDRY COST	$0
6725	SAFETY EQUIP. & SUPPL.	$0
6840	VEHICLE RENTAL	$0
6850	VEHICLE ALLOWANCE	$8,784
6910	COLLECTION FEES	$0
6920	BAD DEBT EXPENSE	$0
	TOTAL OPERATING	$8,784
	TOTAL EXPENSES	$27,734

Appendix D1
Benefits Assessment

AMR System Benefits / Options	AMR - 1 Way	RADIX - FW500
IS&T		
• Application Server – Win 2003	√	X
• Database Server – MS SQL 2000	√	X - See note 1
• Web Server – (MS IIS5, Domino, etc)	√	X
• Client Systems (Win XP, Citrix, IE Browser)	√	√
• Administrator Console(s) (Win XP, Citrix, IE Browser)	√	√
• Communication Technology (Dialup, TCPIP, etc)	√ – See note 2	√
• Customers who interface with JDE/AMX Billing	X - See note 3	√
• ESRI ARCGIS	√ – See note 4	X
Meter Reading		
• Daily meter reads	√	X
• Peak kw and Time Stamp	√	√
• On demand reads	X	X
• Daily load statistics in table & graph format	√	X
• Read distance of at least 100kms	√	√
• Accommodates load research data collection	X	X
Billing		
• Automatic uploads from receiver points	√	X
• Consolidated Billing	√	X
• Option to bill based on customer selected date	√	X
• Service turn-on/turn-off reads (virtual disconnect)	√ – See note 5	X
• Remote Service Disconnect / Reconnect	X	X
• TOU Billing	X	X
Other		
• Bi-directional Communications	X	X
• Compatible with MV90	X - See note 6	X
• Outage Detection amd Monitoring	√ – See note 7	X
• Outage Mapping	X - See note 8	X
• Daily statistics reports	√	X
• Reliability Indices	X	X
• Line voltage monitoring	√	X
• Detects phase unbalance	√	X
• Detects transformer overloading	√ – See note 9	X
• Collects power quality data	X	X
• Collects line data (ie. Regulators, reclosers)	X	X
• Signal to Noise Ratio Analysis	√	X
• Load control capability	X	X

Appendix D2
Benefits Assessment Notes

1. Database Server
    a. Radix uses paradox 4.5
2. Communication Technology
    a. Existing TS1 Receivers RS232 Serial Port.
3. Current customers who interface with JDE/AMX Billing
    a. Have not identified any specific customer interfaced to JDE yet however, several options exist to allow for ease of data sharing
    b. Billing Extract File Builder available in Command Center
    c. Stored procedures are available for Hitting Database, thus avoiding Hitting Tables.
    d. MVRS import/export file supported in Command Center v2.2, if JDE supports MVRS Structure then Command Center 2.2 will provide interface
    e. SQL Server views are available
    f. Hunt works with each new customer to support their individual preferences and efforts
    g. Each Command Center version release contains additional built-in Interface Options, perhaps NLH & Hunt can team up to build a link to JDE for billing extract files.
4. ESRI ARCGIS
    a. CS application is Multi-Speak 2 compliant
    b. Ease of Integration with Other MS2 Applications
    c. ESRI is Part of the MS2 Project
    d. Hunt has Customers like Crow Wing Power using GEO MDB ODBC Relational Link to tie CIS, IVR, OMS, WMS and AMR together with ESRI ArcInfo 8 GIS.
5. Virtual Disconnect
    a. In the Command Center meters marked for no consumption can be grouped together and will flag if consumption occurs.
6. Compatible with MV90
    a. An interface will have to be built however the MV90 system is not meant for large volumes of data such as an AMR system
7. Outage Detection and Monitoring
    a. Hunt one-way - 30 minute delay
8. Outage Mapping
    a. Requires a separate outage management system
        - Brings back the number of times momentary interruptions
9. To use the Hunt Systems for transformer overloading will need to tie transformer pole to the service locations. This can be done with a GIS

Appendix E
Data Communications Options

Site	Equip	Labour	Monthly	
Nain Diesel Plant	$150.00	$550.00	$9.75	
Ramea Diesel Plant	$150.00	$550.00	$9.75	
Cartwright Diesel Plant	$150.00	$550.00	$9.75	
Mary's Harbour Diesel Plant	$150.00	$550.00	$9.75	
Port Hope Simpson Diesel Plant	$150.00	$550.00	$9.75	
Hopedale Diesel Plant	$150.00	$550.00	$9.75	
Charlottetown Diesel Plant	$150.00	$550.00	$9.75	
Makkovik Diesel Plant	$150.00	$550.00	$9.75	
Rigolet Diesel Plant	$150.00	$550.00	$9.75	
Little Bay Islands Diesel Plant	$150.00	$550.00	$9.75	
St. Brendan's Diesel Plant	$150.00	$550.00	$9.75	
St. Lewis Diesel Plant	$150.00	$550.00	$9.75	
Postville Diesel Plant	$150.00	$550.00	$9.75	
Black Tickle Diesel Plant	$150.00	$550.00	$9.75	
Rencontre East Diesel Plant	$150.00	$550.00	$9.75	
Francois Diesel Plant	$150.00	$550.00	$9.75	
Grey River Diesel Plant	$150.00	$550.00	$9.75	
McCallum Diesel Plant	$150.00	$550.00	$9.75	
William's Harbour Diesel Plant	$150.00	$550.00	$9.75	
Paradise River Diesel Plant	$150.00	$550.00	$9.75	
Norman Bay Diesel Plant	$150.00	$550.00	$9.75	
Happy Valley Terminal Station	$150.00	$550.00	$9.75	
Wabush Terminal Station	$150.00	$550.00	$9.75	
St. Anthony Terminal Station	$150.00	$550.00	$9.75	2007
South Brook Terminal Station	$150.00	$550.00	$9.75	
Farewell Head Terminal Station	$150.00	$550.00	$9.75	
Bottom Waters Terminal Station	$150.00	$550.00	$9.75	
Barachoix Terminal Station	$3,125.00	$550.00	$239.80	2007
Hawke's Bay Terminal Station	$150.00	$550.00	$9.75	
Terminal Station # 2 (Bay D'Espoir)	$3,125.00	$550.00	$239.80	2007
Rocky Harbour Terminal Station	$150.00	$550.00	$9.75	
Plum Point Terminal Station	$150.00	$550.00	$9.75	
L'anse au Loup Diesel Plant	$150.00	$550.00	$9.75	
Roddickton Terminal Station	$150.00	$550.00	$9.75	
Grandy Brook Terminal Station	$150.00	$550.00	$9.75	
Bear Cove Terminal Station	$150.00	$550.00	$9.75	
Glenburnie Terminal Station	$3,125.00	$550.00	$239.80	
English Hr. West Terminal Station	$3,125.00	$550.00	$239.80	
Springdale Terminal Station (NP)	$649.00	$550.00	$156.55	
Jackson's Arm Terminal Station	$3,125.00	$550.00	$239.80	
Cow Head Terminal Station	$150.00	$550.00	$9.75	
Conne River Substation	$3,125.00	$550.00	$239.80	2007
Little Bay Substation	$3,125.00	$550.00	$239.80	
Daniel's Harbour Terminal Station	$150.00	$550.00	$9.75	
Hampden Terminal Station	$3,125.00	$550.00	$239.80	
Parson's Pond Terminal Station	$649.00	$550.00	$156.55	
Fleur de Lys Recloser Station (?)	$3,125.00	$550.00	$239.80	
Main Brook Terminal Station	$649.00	$550.00	$156.55	
Westport Substation (?)	$3,125.00	$550.00	$239.80	
Paradise River Terminal Station	$150.00	$550.00	$9.75	
Petit Forte Substation	$3,125.00	$550.00	$239.80	
Wiltondale Terminal Station	$3,125.00	$550.00	$239.80	
Sally's Cove	$3,125.00	$550.00	$239.80	
	$48,122.00	$29,150.00	$3,947.80	
2007 Costs	$9,525.00	$2,200.00	$729.15	