

OCC EXHIBIT NO. \_\_\_\_\_

**BEFORE  
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of The East )  
Ohio Gas Company d/b/a Dominion East ) Case No. 07-829-GA-AIR  
Ohio for Authority to Increase Rates for its )  
Gas Distribution Service. )

In the Matter of the Application of The East )  
Ohio Gas Company d/b/a Dominion East ) Case No. 07-830-GA-ALT  
Ohio for Approval of an Alternative Rate )  
Plan for its Gas Distribution Service. )

In the Matter of the Application of The East )  
Ohio Gas Company d/b/a Dominion East ) Case No. 07-831-GA-AAM  
Ohio for Approval to Change Accounting )  
Methods. )

In the Matter of the Application of The East )  
Ohio Gas Company d/b/a Dominion East )  
Ohio for Approval of Tariffs to Recover )  
Certain Costs Associated with a Pipeline ) Case No. 08-169-GA-ALT  
Infrastructure Replacement Program )  
Through an Automatic Adjustment Clause )  
and for Certain Accounting Treatment. )

In the Matter of the Application of The East )  
Ohio Gas Company d/b/a Dominion East )  
Ohio for Approval of Tariffs to Recover ) Case No. 06-1453-GA-UNC  
Certain Costs Associated with Automated )  
Meter Reading and for Certain Accounting )  
Treatment. )

**DIRECT TESTIMONY  
And  
PUBLIC ATTACHMENT  
  
OF  
TREVOR R. ROYCROFT, Ph.D.**

**ON BEHALF OF THE  
OFFICE OF THE OHIO CONSUMERS' COUNSEL  
10 West Broad St., Suite 1800  
Columbus, OH 43215**

**June 23, 2008**

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## ATTACHMENTS

TRR-1	Trevor Roycroft Curriculum Vitae
TRR-2	DEO Response to Blue Ridge MTD 03-02 Data Request No. a-d, i
TRR-3	DEO Response to Staff Data Request No. 2-8
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TRR-9	DEO Response to Staff Data Request No. 2-4
TRR-10	DEO Response to OCC Interrogatory No. 517.

1    **I.    INTRODUCTION**

2    **Q1.   PLEASE STATE YOUR NAME, ADDRESS, AND POSITION.**

3    **A1.**   My name is Trevor R. Roycroft. My business address is 51 Sea Meadow Lane,  
4           Brewster, MA, 02631. I am an independent consultant providing economic and  
5           policy analysis related to telecommunications, public utility, and information  
6           technology industries.

7  
8    **Q2.   PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND**  
9           **PROFESSIONAL EXPERIENCE.**

10   **A2.**   In June 1984 I received the Bachelor of Arts degree in Economics with a minor in  
11           Statistics from California State University, Sacramento. The degree was awarded  
12           with honors. In September of 1986 I received the Master of Arts degree in  
13           Economics from the University of California, Davis. In December of 1989 I  
14           received the Doctor of Philosophy in Economics from the University of  
15           California, Davis. My Ph.D. fields of specialization are Economic Theory,  
16           Industrial Organization, Public Sector Economics, and Economic History.

17  
18           I am an independent consultant with seventeen years of experience in the public  
19           utility field. This experience began with my employment at the Indiana Office of  
20           Utility Consumer Counselor ("OUCC") during the years 1991 to 1994. For most  
21           of my tenure at the OUCC I was Chief Economist, and I supervised a staff of  
22           seven economists and financial analysts. My primary areas of analytical  
23           responsibility at the OUCC related to telecommunications regulation and policy,

1 including incentive regulation plans. I was also involved in natural gas, electric,  
2 and water utility cases, and filed testimony and supervised staff involved in these  
3 utility areas. I have also been involved in higher education related to the  
4 telecommunications field. From 1994 to 2004 I was a professor in the J. Warren  
5 McClure School of Communication Systems Management at Ohio University. At  
6 Ohio University I was granted tenure and promoted to Associate Professor in the  
7 Spring of 2000. At Ohio University my primary areas of teaching responsibility  
8 were graduate and undergraduate courses covering regulatory policy, the  
9 economics of the telecommunications industry, consumer issues with  
10 telecommunications markets, and telecommunications technology. I left Ohio  
11 University to pursue consulting on a full-time basis at the end of 2004.

12  
13 I have published research on a variety of topics in the telecommunications field in  
14 refereed journals including *The Journal of Regulatory Economics*, *Contemporary*  
15 *Economic Policy*, and *Telecommunications Policy*. I have contributed chapters  
16 which have been published in book volumes related to the telecommunications  
17 field. I have provided referee service to various academic journals including *The*  
18 *Journal of Regulatory Economics*, *Telecommunications Policy*, *Social Science*  
19 *Computer Review*, *Utilities Policy*, *Journal of Economic Studies*, and  
20 *Communications of the Association for Information Systems*. I have provided  
21 analysis and testimony as an independent consultant since 1994. In my role as a  
22 consultant, I have addressed a wide variety of issues including incentive  
23 regulation plans, cost-of-service studies, cost modeling, service quality reviews,

1 and competition. I have filed testimony, reports, and affidavits before state  
2 regulatory commissions, before the Federal Communications Commission, and  
3 before the Canadian Radio-Television and Telecommunications Commission. I  
4 have also provided expert services in class action lawsuits associated with the  
5 public utility field. I have attached hereto Exhibit A which is a true and correct  
6 copy of my most recent curriculum vita.

7  
8 **Q3. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE**  
9 **PUBLIC UTILITIES COMMISSION OF OHIO?**

10 **A3.** Yes, I have submitted testimony in the following Public Utilities Commission of  
11 Ohio ("Commission" or "PUCO") cases: AT&T Ohio, Case No. 06-1013-TP-  
12 BLS; Cincinnati Bell, Case No. 06-1002-TP-BLS; Implementation of House Bill  
13 218, Case No. 05-1305-TP-ORD; SBC Ohio, Case No. 02-1280-TP-UNC;  
14 SBC/Ameritech, Case No. 98-1082-TP-AMT; Cincinnati Bell, Case No. 96-899-  
15 TP-ALT; MFS INTELENET, Case No. 94-2019-TP-ACE; Ohio Bell, Case No.  
16 93-487-TP-ALT and 93-576-TP-CSS.

17  
18 **Q4. WHAT DOCUMENTS HAVE YOU REVIEWED IN THE PREPARATION OF**  
19 **YOUR TESTIMONY?**

20 **A4.** I have reviewed the Dominion East Ohio ("DEO" or "the Company") Automatic  
21 Meter Reading ("AMR") Application in Case No. 06-1453-GA-UNC and the  
22 Company's Rate Case Application. I have reviewed DEO's Direct Testimony and  
23 Schedules filed in this proceeding. I have reviewed DEO's responses to Office of

1 Consumers' Counsel ("OCC"), Staff, and Blue Ridge Consulting Services Inc.  
2 discovery. I attended the depositions of DEO witnesses, and have reviewed  
3 deposition transcripts associated with DEO witnesses. I have reviewed the Staff's  
4 Report of Investigation ("Staff Report"), and Blue Ridge Consulting Services,  
5 Inc. Report of Conclusions and Recommendations ("Blue Ridge Report"). I have  
6 reviewed documents relating to automatic meter reading devices.

7  
8 **Q5. PLEASE SUMMARIZE YOUR RECOMMENDATION REGARDING DEO'S**  
9 **AMR PROPOSAL.**

10 **A5.** My review of DEO's application, and information obtained from DEO through  
11 the discovery process, indicates that DEO's proposal to fully deploy AMR  
12 technology to all outside meters is not a reasonable or prudent use of ratepayer  
13 funds. DEO's business case analysis shows that the full deployment of AMR  
14 devices is at best a marginally cost effective alternative, and DEO's business case  
15 analysis clearly shows that a partial deployment of the AMR technology, focusing  
16 on inside meters, is a superior alternative. Based on my analysis, I recommend  
17 that the Commission disallow from rate base \$45 million in investment associated  
18 with DEO's AMR proposal.

19  
20 I also recommend that all cost savings associated with deployment of AMR  
21 devices be included in any AMR cost recovery charge.

1    **II.    PURPOSE OF TESTIMONY**

2    **Q6.    WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

3    **A6.**    My testimony will support certain OCC objections to the Staff Report and address  
4            the issues raised by these objections as they relate to rate base and operating  
5            income. Specifically, I will address DEO's proposed AMR deployment program.  
6            I will evaluate whether DEO's choice of full deployment of AMR technology to  
7            all residential meters is the most efficient and cost effective use of ratepayer  
8            funds. I will also examine whether DEO has included appropriate cost savings in  
9            its proposal to offset a portion of the AMR costs that it proposes to recover from  
10           ratepayers through the AMR Cost Recovery Charge. I will evaluate the treatment  
11           of these issues in the Staff Report and the Blue Ridge Report. I will also consider  
12           whether the recommendations in the Staff Report regarding adjustments to DEO's  
13           AMR program are appropriate, and whether the structure of the AMR Cost  
14           Recovery Charge recommended in the Staff Report generates reasonable  
15           incentives for DEO.

16  
17    **III.    DEO'S AMR PROPOSAL**

18    **Q7.    PLEASE DESCRIBE AMR TECHNOLOGY.**

19    **A7.**    AMR technology utilizes telecommunications equipment and technology to  
20            reduce the need for manual meter reading. AMR systems typically retrofit natural  
21            gas meters with additional equipment that registers the gas usage, and relays the

1 information to data collection units.<sup>1</sup> The AMR system allows the collection of  
2 meter data from a distance, which then enables the Company personnel who  
3 collect meter data to do so more efficiently. In the case of the specific technology  
4 selected by DEO, the AMR system, once deployed, will enable the collection of  
5 data from a moving vehicle, and will allow data to be more easily incorporated  
6 into DEO's billing systems. As will be discussed below, DEO's stated motivation  
7 for pursuing AMR technology is its need to comply with the Commission  
8 Minimum Gas Service Standards ("MGSS"). According to DEO documents,  
9 AMR was discussed with Staff as a means to comply with the Commission's  
10 MGSS criteria.<sup>2</sup> According to DEO, the main problem with MGSS compliance is  
11 that many meters are located inside a customer's premises.<sup>3</sup> There is no question  
12 that an AMR deployment will improve the ability of DEO to read meters that are  
13 located inside customers' homes. However, as with any business decision, care  
14 must be taken to ensure that the least-cost solution to the problem is implemented.

15  
16 **Q8. WHAT IS DEO'S AMR PROPOSAL?**

17 **A8.** Prior to filing the instant rate case, DEO filed its AMR Application in Case No.  
18 06-1453-GA-UNC seeking approval of AMR deployment, and an associated  
19 approach to cost recovery. DEO later filed a motion to consolidate the AMR  
20 Application with the rate case and other proceedings. DEO proposed installing

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<sup>1</sup> This equipment is typically called an encoder, receiver transmitter or ERT device.

<sup>2</sup> "Dominion East Ohio MGSS Meter Reading Discussion," October 3, 2006. Provided in response to Blue Ridge MTD 03-02 Data Request a-d, I (Attachment TRR-2).

<sup>3</sup> DEO AMR Application in Case No. 06-1453-GA-UNC at. 2. (Hereinafter, "AMR Application.")



1 AMR equipment on all of its remote index meters, and all of its other meters over  
2 a five-year period.<sup>4</sup> DEO stated that the deployment of the AMR system was  
3 needed to comply with the Commission's MGSS, and pointed to the fact that 43  
4 percent of DEO's meters are located inside customer premises as an impediment  
5 to compliance with the MGSS.<sup>5</sup> According to DEO, the total cost of deploying  
6 the AMR system, which will be used to define the AMR cost recovery charge is  
7 \$110 million, to be recovered over a five-year period.<sup>6</sup>

8  
9 DEO further proposed a cost recovery mechanism that will record the  
10 depreciation, incremental property taxes, and post in-service carrying charges  
11 arising from the AMR deployment as a regulatory asset. DEO indicates that  
12 AMR equipment replacing defective or less accurate American and Badger  
13 remote index devices will be excluded from the regulatory asset. DEO also  
14 proposed to require customers that have their service terminated for non-access  
15 (or those that have been found to tamper with meters) to pay for the placement of  
16 AMR equipment, thus also excluding these costs from the regulatory asset.<sup>7</sup>

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<sup>4</sup>Id.

<sup>5</sup>AMR Application at 1-2.

<sup>6</sup>AMR Application at 4. DEO response to Staff Data Request Nos. 2-8 (Attachment TRR-3) and 2-9 (Attachment TRR-4).

<sup>7</sup>AMR Application at 4-8.

Table 1: DEO's Projection of AMR Cumulative Revenue Requirement. <sup>8</sup>	
Year	Monthly Per Customer Cumulative Revenue Requirement
2008	\$0.35
2009	\$0.53
2010	\$0.83
2011	\$1.19
2012	\$1.15

DEO projected that the cumulative revenue requirement will have the magnitude shown in Table 1, above, not accounting for AMR-related cost savings.

DEO proposed that each year following the AMR deployment it will track the cost savings resulting from the AMR deployment as reflected in meter reading Operating and Maintenance ("O&M") expense. DEO indicated that it will use the cost savings associated with the meter reading O&M expense as an offset to the regulatory asset.

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<sup>8</sup> DEO response to Staff Data Request No. 2-13 (Attachment TRR-5).

1 DEO also stated that as future rate cases are filed, the AMR Cost Recovery  
2 Charge will be reduced to reflect the inclusion of the AMR investments in rate  
3 base.<sup>9</sup>

4  
5 **IV. STAFF REPORT RESPONSE TO DEO'S AMR PROPOSAL**

6 **Q9. WHAT IS STAFF'S RESPONSE TO THE DEO AMR PROPOSAL?**

7 **A9.** Staff generally agreed with DEO's AMR deployment plan and accepted the  
8 schedule of charges identified by DEO as representative of the level of the AMR  
9 Cost Recovery Charge that will be paid by consumers.<sup>10</sup> Table 2, below,  
10 reproduces the AMR Cost Recovery Charge Schedule identified in the Staff  
11 Report, and projects revenues based on customer counts reported in DEO's  
12 responses to discovery.<sup>11</sup> The Staff Report indicated that the AMR Cost  
13 Recovery Charges shown in Table 2 are higher than those that DEO would  
14 actually charge, as the estimated charges are not reduced to account for meter-  
15 reading O&M expense savings.<sup>12</sup> Table 2 shows that Staff's proposed AMR Cost  
16 Recovery Charge will generate approximately \$63.5 million in revenues during  
17 the period 2008-2012.

18  
19  

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<sup>9</sup>DEO response to Staff Data Request No.2-13 (Attachment TRR-5).

<sup>10</sup> Staff Report at 42-43.

<sup>11</sup>DEO response to Staff Data Request No. 2-8 (Attachment TRR-3).

<sup>12</sup>Staff Report at 41.

1

Table 2: AMR Cost Recovery Charge identified by Staff, and projected revenues.		
Year	Monthly AMR Cost Recovery Charge Identified by Staff	Annual Revenues
2008	\$0.35	\$5,493,600
2009	\$0.53	\$8,318,880
2010	\$0.83	\$13,027,680
2011	\$1.19	\$18,678,240
2012	\$1.15	\$18,050,400
Total Staff AMR Cost Recovery Charge Revenues 2008-2012		\$63,568,800

2

3 **Q10. YOU MENTIONED THAT THE CHARGES IDENTIFIED BY STAFF DO**  
4 **NOT INCLUDE THE COST SAVINGS ADJUSTMENT ASSOCIATED WITH**  
5 **THE METER READING O&M EXPENSE. WHAT IMPACT WILL THAT**  
6 **HAVE ON THE AMR COST RECOVERY CHARGE?**

7 **A10.** Meter reading O&M expense savings projections are shown in Table 3, below.<sup>13</sup>

8

Table 3: Meter Reading O&M Savings	
Year	
2009	\$900,000
2010	\$1,300,000
2011	\$2,950,000
2012	\$6,000,000
Total	\$11,150,000

9

<sup>13</sup>DEO response to Staff Data Request No. 2-12 (Attachment TRR-6).

1        These projected cost savings will total about \$11 million over the relevant period  
2        (2009-2012), and have the potential to offset the AMR cost recovery charge by a  
3        similar amount.

4

5        ***Q11. WILL DEO EXPERIENCE OTHER COST SAVINGS BENEFITS OTHER***  
6        ***THAN METER READING O&M EXPENSE COST SAVINGS AS A RESULT***  
7        ***OF THE AMR DEPLOYMENT?***

8        ***A11.*** Yes. DEO will also experience cost savings associated with its call center  
9        operations (both headcount reductions and phone bill savings), and savings  
10       associated with the distribution of written communications with its customers.  
11       According to the Company's own calculations, when the AMR system is fully  
12       deployed, DEO will experience reduced costs associated with its call center  
13       operations of approximately \$785,000 per year.<sup>14</sup>

14

15       ***Q12. IS IT REASONABLE TO EXPECT THAT THERE ARE OTHER SOURCES***  
16       ***OF COST SAVINGS ASSOCIATED WITH THE DEPLOYMENT OF THE***  
17       ***AMR SYSTEM BEYOND THE METER READING O&M EXPENSE***  
18       ***SAVINGS AND THE CALL CENTER COST SAVINGS?***

19       ***A12.*** Yes. Another source of cost savings are savings associated with meter tampering  
20       and theft of service. Itron, the AMR vendor selected by DEO, identifies theft

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<sup>14</sup>DEO response to Staff Data Request No. 6-11 (Attachment TRR-7).

1 reduction as one of the benefits of the deployment of its technology.<sup>15</sup> Other  
2 research demonstrates that the deployment of AMR technology in electric systems  
3 to combat theft passes a cost/benefit test.<sup>16</sup> DEO indicated that elimination of  
4 fraudulent practice, tampering, and theft of service is one component of the  
5 Company's AMR deployment strategy.<sup>17</sup> Thus, it is reasonable to expect that  
6 DEO will experience cost savings associated with reductions in fraud and theft.<sup>18</sup>

7  
8 **Q13. DOES DEO INDICATE THAT COST SAVINGS FROM THE DEPLOYMENT**  
9 **OF THE AMR TECHNOLOGY WILL BE OF A MAGNITUDE GREATER**  
10 **THAN THE \$6 MILLION PER YEAR IN METER READING O&M COST**  
11 **SAVINGS?**

12 **A13.** Yes. In its response to Comments filed by OCC in Case No. 06-1452-GA-UNC,  
13 the Company stated:

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<sup>15</sup>See Itron product description at:

[http://www.itron.com/pages/products\\_detail.asp?id=itr\\_000427.xml](http://www.itron.com/pages/products_detail.asp?id=itr_000427.xml)

<sup>16</sup>Ghajar, R., and Khalife, J. "Cost/benefit analysis of an AMR system to reduce electricity theft and maximize revenues for Electricité du Liban," *Applied Energy*, Vol. 76, 2003 at 25-37.

<sup>17</sup>AMR Application at 6.

<sup>18</sup>The precise magnitude of the benefits of fraud and tampering prevention is not known as DEO did not calculate fraud prevention or theft as part of the quantitative analysis associated with its business case. DEO response to OCC Request For Production No. 160 (Attachment TRR-8), "CONFIDENTIAL DOCUMENT - OCC-Request For Production No. 160 - AMR BUSINESS CASE 2\_20\_06.xls." Mr. Armstrong indicated in his deposition that fraud and tampering were not considered in the business case. Armstrong Deposition Transcript at 85.

1 DEO estimates that when fully deployed, AMR will result  
2 in O&M savings that will exceed the estimated annual  
3 depreciation, property tax and return on rate base  
4 associated with a system-wide AMR deployment.<sup>19</sup>

5  
6 Mr. Murphy, in his deposition, stated that once AMR is fully deployed, that O&M  
7 savings could exceed the revenue requirement associated with the AMR system,  
8 and that the AMR Cost Recovery Charge could take a negative value, resulting in  
9 a credit on customer bills.<sup>20</sup>

10  
11 ***Q14. DOES THE STAFF REPORT PROPOSE TO ACCOUNT FOR ANY OF***  
12 ***THESE ADDITIONAL SAVINGS?***

13 ***A14.*** No. However, it is appropriate to account for all cost savings beyond the meter  
14 reading O&M cost savings identified by the Company.

15  
16 DEO has even provided a specific estimate of the call center operations cost  
17 savings. According to DEO, the largest call center cost savings will result from  
18 installing AMR equipment associated with indoor meters.<sup>21</sup> Once AMR  
19 equipment is deployed, DEO should experience decreases in its call volume.

20 Table 4, below, shows the projected impact of the deployment of the AMR

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<sup>19</sup>Response to Comments of Office of the Ohio Consumers' Counsel, Case No. 06-1452-GA-UNC, (April 9, 2007) at 7.

<sup>20</sup>Murphy Deposition Transcript at 71-72.

<sup>21</sup>DEO response to Staff Data Request No. 6-11 (Attachment TRR-7).

1 system on call center costs, using the deployment schedule identified by DEO.

2 Table 4 uses DEO's deployment schedule to project the annual Call Center  
3 savings.<sup>22</sup>

4

Table 4: Projected Call Center Cost Savings	
Year	Call Center Cost Reductions
2009	\$194,000
2010	\$360,000
2011	\$552,000
2012 (Full Deployment)	\$785,000

5

6 For the same reasons discussed above, that it is appropriate to decrease the AMR  
7 Cost Recovery Charge to reflect all cost savings including decreases in the meter  
8 reading O&M expense, and DEO's call center operations savings.

9  
10 ***Q15. DEO'S ESTIMATE OF CALL CENTER COST SAVINGS REFLECTS A***  
11 ***FULLY DEPLOYED SYSTEM. WILL CALL CENTER COST SAVINGS***  
12 ***OCCUR PRIOR TO FULL DEPLOYMENT?***

13 ***A15.*** Yes. DEO identified three drivers for the call center cost savings.<sup>23</sup> First, AMR  
14 deployment will affect call volumes, and reduce the need for full time equivalent

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<sup>22</sup>The projection in this table lags by one year the proportion of DEO's meter plant that is replaced with AMR equipment, and uses that proportion to adjust the full deployment cost savings identified by the Company (\$785,000).

<sup>23</sup>"Cost Saving of the AMR Deployment Plan for Call Center Operations," DEO response to Staff Data Request No. 6-11 (Attachment TRR-7).



1 ("FTE") call center staff. DEO estimated that at full deployment it will need ten  
2 (10) fewer call center FTEs, and that this will generate annual savings of  
3 approximately \$658,000. If DEO waits until full deployment to make any cuts to  
4 call center FTEs, DEO will be operating inefficiently, because it will be over-  
5 staffed. It is reasonable to expect DEO to scale back its call center staffing during  
6 deployment as call volumes decline, just as it will scale back meter reading  
7 personnel as the AMR system is rolled out. The other two cost drivers for the call  
8 center savings, phone bill savings and customer correspondence savings arise as  
9 AMR is deployed and reduce the need for customer contact with DEO. DEO is  
10 likely to experience similar cost reductions in these areas prior to full deployment  
11 as well.

12  
13 Staff's treatment of the call center deployment costs overlooks the impact of these  
14 savings at full deployment. According to DEO, the AMR system will be fully  
15 deployed by 2011. As proposed, the AMR Cost Recovery Charge will continue  
16 to be assessed through 2012, and possibly beyond, depending on when DEO's  
17 next rate case is filed.<sup>24</sup> Thus, even if the Commission does not accept the call  
18 center cost savings as being an appropriate offset to the AMR cost recovery  
19 charge prior to full deployment, the Commission should require this offset once  
20 full deployment is achieved. Failure to include the offset based on call center cost  
21 reductions in the AMR Cost Recovery Charge will lead to over-recovery by the  
22 Company.

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<sup>24</sup> Murphy Deposition Transcript at 47-48.

1 **Q16. WHAT HAPPENS WITH THE AMR COST RECOVERY CHARGE AFTER**  
2 **2012?**

3 **A16.** The future of the AMR Cost Recovery Charge depends on date-certain time  
4 frames associated with DEO's next rate case. If DEO were, for example, to have  
5 a future rate case with the date certain period at December 31, 2012, then it seems  
6 likely that all AMR investment would be complete, and the AMR Cost Recovery  
7 Charge would be reduced. On the other hand, if there was no rate case for a  
8 longer period, say until 2016, then there would be an extended period during  
9 which the AMR Cost Recovery Charge would still be in effect, and it is thus  
10 essential that all cost savings be reflected in the offset to the AMR Cost Recovery  
11 Charge for the life of the AMR project. DEO has indicated that the project will  
12 ultimately lead to O&M savings that will exceed the estimated annual  
13 depreciation, property tax, and return on rate base associated with a system-wide  
14 deployment.<sup>25</sup> Thus, there is a potential for a customer credit associated with the  
15 AMR rider if the benefits of deployment associated with the O&M cost savings  
16 exceed the depreciation, property tax, and return on rate base, as Mr. Murphy  
17 predicts.<sup>26</sup>

18  
19 **Q17. DOES STAFF'S APPROACH TO THE AMR COST RECOVERY CHARGE**  
20 **CREATE AN APPROPRIATE INCENTIVE STRUCTURE FOR DEO?**

21 **A17.** No. Regulatory lag provides an incentive for the management of a regulated

---

<sup>25</sup> DEO's *Response to Comments of the Office of the Ohio Consumers' Counsel*, (April 9, 2007) at 7.

<sup>26</sup> Murphy Deposition Transcript at 70-72.

1 company to reduce costs between rate cases.<sup>27</sup> When regulatory lag is operative,  
2 the management of the regulated company has incentives to cut costs, as  
3 improving efficiency allows the utility to improve shareholder return prior to the  
4 subsequent rate case. However, in the case of the regulatory asset created with  
5 the AMR deployment, the normal regulatory lag incentive is undermined as  
6 Staff's acceptance of DEO's recovery proposal allows the Company to self-adjust  
7 the AMR Cost Recovery Charge. Thus, for example, if DEO fails to reduce  
8 headcount in its meter reading department, or in its call center, in an efficient  
9 manner (i.e., one that reflects the actual need for resources), then DEO will be  
10 able to continue to recover these inefficiently incurred costs through the AMR  
11 Cost Recovery Charge, at the same time these un-necessary costs are recovered in  
12 rates.

13  
14 To provide a better and more accurate incentive structure, DEO should be  
15 required to offset the AMR Cost Recovery Charge by an amount equal to either  
16 the actual cost savings associated with reductions in Meter Reading O&M  
17 expense and Call Center operations expense, or the level of projected cost savings  
18 identified by DEO for the Meter Reading O&M expense and Call Center  
19 operations, whichever is higher as ratepayers deserve to accrue the benefits of  
20 these cost savings associated with the AMR deployment. The Table 5, below,

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<sup>27</sup>James C. Bonbright, et al, *Principles of Public Utility Rates*, 2<sup>nd</sup> Edition, Public Utilities Reports, Inc., Arlington, VA, (1988) at 198.

reports values that should be to used provide the minimum annual offsets to the  
AMR regulatory asset.<sup>28</sup>

Table 5: Projected Meter Reading O&M and Call Center Savings Associated with AMR Deployment			
Year	Meter Reading O&M Cost Reductions	Call Center Cost Reductions	Total Annual Cost Reductions
2009	\$900,000	\$194,000	\$1,094,000
2010	\$1,300,000	\$360,000	\$1,660,000
2011	\$2,950,000	\$552,000	\$3,502,000
2012 (Full Deployment)	\$6,000,000	\$785,000	\$6,785,000

Using this approach to reduce the regulatory asset will provide a superior  
incentive structure associated with the deployment of the AMR system.

**Q18. DOES STAFF MAKE ANY ADJUSTMENTS TO DEO'S AMR PROPOSAL?**

**A18.** Yes. Staff identified four adjustments to DEO's AMR proposal.<sup>29</sup> First, Staff proposed to exclude the cost of replacement of obsolete tin-cased meters from the AMR Cost Recovery Charge. Staff proposed that this cost should instead be recovered through the normal rate-case recovery mechanism. This adjustment will result in a lower AMR Cost Recovery Charge.

<sup>28</sup>Meter Reading O&M savings from DEO Response to Staff Data Request 2-12 (Attachment TRR-6). Call Center Savings from DEO Response to Staff Data Request No. 6-11 (Attachment TRR-7).

<sup>29</sup>Staff Report, p. 43.

1 Second, Staff noted that during the process of installing AMR devices, it is likely  
2 that other routine maintenance will be conducted. Staff proposed that routine  
3 maintenance conducted on the same visit as an AMR installation should be  
4 excluded from the AMR Cost Recovery Charge, and should instead be recovered  
5 through normal rate case cost-recovery mechanisms. This adjustment will also  
6 result in a lower AMR Cost Recovery Charge.

7  
8 Third, DEO included a charge in its proposed "non-access" tariff that would have  
9 required disconnected customers to pay for an AMR installation and device to  
10 regain service. Staff rejected DEO's non-access tariff, noting that these  
11 customers would be required to pay this charge as well as the monthly AMR Cost  
12 Recovery Charge. Staff recommended that monthly AMR charge be the only  
13 AMR-related charged paid by a customer.

14  
15 Finally, Staff proposed to use 2007 as the baseline year for the adjustment of the  
16 regulatory asset. Staff argued that DEO has not yet begun to realize the savings  
17 resulting from the AMR installations. As justification, Staff pointed to higher  
18 total Meter Reading O&M expense for 2007 than in 2006 (DEO's proposed  
19 baseline year). The impact of this adjustment on future AMR Cost Recovery  
20 Charges will be discussed further below.

21  
22 **Q19. DO YOU BELIEVE THAT THESE ADJUSTMENTS ARE APPROPRIATE?**

23 **A19.** Yes, with a qualification. The first three of Staff's adjustments appear to be

1 reasonable: First, with regard to the tin-case meters, as these meters are obsolete  
2 and incompatible with AMR technology, it makes sense to exclude the  
3 replacement cost from the AMR Cost Recovery Charge. Second, it makes sense  
4 to exclude non-AMR-related maintenance from the AMR Recovery Charge.  
5 Third, eliminating the double payment potential by striking the non-access AMR  
6 installation charge is a reasonable action.

7  
8 However, Staff's position on the baseline year raises an important question.  
9 While the Staff Report indicated that DEO has deployed 18,000 AMRs in 2007  
10 that should be excluded from the regulatory asset associated with the AMR Cost  
11 Recovery Charge,<sup>30</sup> this only reflects meter deployment through March 31, 2007,  
12 the date certain in this case.<sup>31</sup> However, according to the Blue Ridge Report,  
13 DEO installed a total of 130,000 AMR units in 2007.<sup>32</sup> Thus, DEO is well  
14 underway for the AMR process, and it is possible that DEO's meter reading O&M  
15 expense for 2007 reflects the impact of the AMR installation. As Staff's proposal  
16 does not acknowledge the additional 112,000 meters, the baseline year does not  
17 reflect an accurate "before AMR" picture.

18  

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<sup>30</sup>Staff Report at 41.

<sup>31</sup>DEO response to Staff Data Request No. 2-4. (Attachment TRR-9)

<sup>32</sup>Blue Ridge Report at 140, footnote 339.

**V. DEO'S BUSINESS CASE FOR THE AMR AND THE DESIRABILITY OF  
FULL DEPLOYMENT**

***Q20. DID DEO PREPARE A BUSINESS CASE RELATED TO THE AMR  
PROJECT?***

***A20.*** Yes. DEO developed a business case that assumed several alternative AMR deployment scenarios. These scenarios were based on a three-year deployment schedule, and utilized alternative assumptions regarding the nature of the AMR deployment. The key difference between the AMR scenarios considered by DEO was whether to replace all meters with the AMR equipment, or whether to focus only on the replacement of the meters that were located indoors, which made them more difficult to read, and thus interfered with DEO's ability to comply with the MGSS.<sup>33</sup>

***Q21. WHAT IS THE PURPOSE OF CONDUCTING A BUSINESS CASE  
ANALYSIS WHEN CONSIDERING CAPITAL DEPLOYMENT?***

***A21.*** Capital budgeting is a foundation of business operations. Capital is a limited resource. Faced with limited sources of capital, management must carefully decide whether a particular project is economically acceptable. In cases where multiple projects are under consideration, management must identify the projects that have the greatest potential to contribute most to the value of the firm. This, in essence, is the basis of capital budgeting.

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<sup>33</sup> In its business case DEO also considered two vendor alternatives that were associated with different technology option: the Itron system and a Hexagram network system.

1 **Q22. DOES A BUSINESS CASE ANALYSIS PLAY AN ADDITIONAL ROLE FOR**  
2 **A REGULATED FIRM LIKE DEO?**

3 **A22.** Yes. For a regulated utility like DEO, the ratemaking process calls for a careful  
4 evaluation of the use of ratepayer supplied capital. Ratepayer funds should be  
5 utilized to fund the most efficient projects consistent with the reliable provision of  
6 the regulated service. Ohio Revised Code §4909.154 states:

7 In fixing the just, reasonable, and compensatory rates, joint rates,  
8 tolls, classifications, charges, or rentals to be observed and charged  
9 for service by any public utility, the public utilities commission  
10 shall consider the management policies, practices, and organization  
11 of the public utility. The commission shall require such public  
12 utility to supply information regarding its management policies,  
13 practices, and organization.

14

15 If the commission finds after a hearing that the management  
16 policies, practices, or organization of the public utility are  
17 inadequate, inefficient, or improper, the commission may  
18 recommend management policies, management practices, or an  
19 organizational structure to the public utility.

20



1 In any event, the public utilities commission shall not allow such  
2 operating and maintenance expenses of a public utility as are  
3 incurred by the utility through management policies or  
4 administrative practices that the commission considers imprudent.  
5

6 This provision of Ohio's statute is consistent with the Commission's oversight of  
7 DEO's capital deployment decisions, and indicates the need to carefully review  
8 DEO's proposal to spend \$110 million to deploy AMR technology to all of  
9 DEO's meters. A business case analysis allows the Commission to examine the  
10 projected outcomes associated with various capital deployment options associated  
11 with AMR. If alternative capital deployment options are being considered, the  
12 business case analysis allows the Commission to evaluate which of the  
13 alternatives represents a prudent application of ratepayer-supplied capital. If  
14 DEO has prepared a reasonable business case, and if DEO is then observed to  
15 pursue actions that are in conflict with the business case projections, then the  
16 Commission should reject the full recovery of investment costs from DEO's  
17 ratepayers, as the investments are not prudent.  
18

19 **Q23. WHAT ARE TYPICAL TOOLS APPLIED IN A BUSINESS CASE**  
20 **ANALYSIS?**

21 **A23.** The purpose of a business case is to evaluate the impact of a specific decision on  
22 the operations, and ultimately the profitability of a firm. Rather than jumping into  
23 a project and "hoping for the best," a business case raises a hurdle that requires a

1 project to meet threshold performance measures. If there are multiple projects  
2 being considered, the firm can, through the analysis associated with the business  
3 case, determine whether any of the competing projects meet the pre-specified  
4 criteria. If multiple projects meet the threshold, the analysis associated with the  
5 business case should also enable ranking of the various projects to determine  
6 which is superior. If DEO's business case for AMR identifies a least cost solution  
7 to the projects objectives of assisting with the transition to the new MGSS  
8 standards, pursuit of non-least cost AMR deployments will channel capital away  
9 from other projects such as DEO's proposed Pipeline Infrastructure Replacement  
10 Plan.

11  
12 Quantitative decision criteria are typically applied in the course of a business  
13 case. These may include application of net present value ("NPV") analysis,  
14 evaluation of the internal rate of return ("IRR"), or consideration of a payback  
15 period.

16  
17 ***Q24. PLEASE EXPLAIN THESE DECISION CRITERIA?***

18 ***A24.*** Yes. The NPV method requires that benefits and costs be identified for a specific  
19 time period associated with a project. The NPV method applies a discount factor  
20 (typically reflecting the firm's opportunity cost of capital) to the net benefits  
21 (expected benefits minus the expected costs) identified for each period, and sums  
22 up the stream of discounted net benefits, resulting in a single number. This single  
23 number reflects the value of the stream of net benefits over time, discounted to the

1 present period. If the result of the NPV approach is positive, then a project can be  
2 considered desirable. On the other hand, a positive NPV value indicates that the  
3 project provides a superior outcome to the next best application of the firm's  
4 capital. If the NPV is negative, pursuit of a project will result in a reduced value  
5 of the firm, and points to the desirability of some other application of the capital.  
6 If there are competing projects, the NPV criteria can be utilized to rank the  
7 alternative projects, with projects displaying higher, positive, NPV values  
8 indicating a superior application of the firm's capital.

9  
10 The IRR approach is similar to the NPV approach, in that it accounts for the time  
11 value of money. The IRR frames its analysis from the perspective of identifying  
12 the discount rate that equates the costs of the initial outlay with the net benefits  
13 expected from the project over time. The project with an IRR that exceeds a  
14 benchmark discount rate (such as a firm's opportunity cost of capital), is deemed  
15 desirable as this indicates that the project will generate a superior outcome for the  
16 firm when compared to the next best application of the capital available for  
17 investment. Competing projects can be ranked by the IRR values.

1       The payback approach identifies the period of time needed to recover the cost of a  
2       project. The payback approach does not take account of the time value of money.  
3       The payback period is considered by some to be a more "crude" method  
4       compared to NPV or IRR to evaluate projects.<sup>34</sup>

5  
6       ***Q25. OF THESE THREE EVALUATION CRITERIA, WHICH IS CONSIDERED***  
7       ***TO BE SUPERIOR?***

8       ***A25.*** The NPV criteria is considered superior. The other methods have problems that  
9       undermine their analytical effectiveness. For example, Table 6, below, illustrates  
10      the problems associated with the payback period. Table 6 shows two hypothetical  
11      projects that each requires an initial outlay of \$100, and then provide a stream of  
12      net benefits.

Table 6: Hypothetical Projects and Payback Analysis			
Project	Initial Outlay	Net Benefits Year 1	Net Benefits Year 2
A	100	110	100
B	100	0	1000

14  
<sup>34</sup>Mishan, E.J. and Quah, E. *Cost-Benefit Analysis*, 5<sup>th</sup> ed., Routledge, London and New York, 2007 at 126.

1 Using the payback period to evaluate these two hypothetical projects indicates  
2 that Project A is superior to Project B, as the payback period is one year for  
3 Project A, and two years for Project B. Thus, the payback criteria ignore the  
4 substantial net benefits that arise for Project B in year two. As a result, the  
5 payback approach does not provide sufficient evaluation criteria.<sup>35</sup>  
6

7 While the NPV and IRR criteria are closely related, NPV is generally considered  
8 to be superior.<sup>36</sup> One of the problems with IRR analysis is that the analysis may  
9 not be capable of generating a unique solution to answer the question of what  
10 value results in the NPV equally zero.<sup>37</sup> Alternatively, with the IRR approach, the  
11 IRR value must be compared to some hurdle, such as the firm's opportunity cost  
12 of capital. However, using the firm's opportunity cost of capital as a discount rate  
13 and the NPV approach generates a unique value, thus NPV provides a more direct  
14 path to determining the desirability of a project. As a result, if multiple decision  
15 criteria are applied when evaluating a project, it is reasonable to give the greatest  
16 weight to the results of NPV analysis.  
17

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<sup>35</sup>Mr. Murphy acknowledged in his deposition that the payback approach to project evaluation was "rudimentary." Murphy Deposition Transcript at 29.

<sup>36</sup>Brealey, R. and Meyers, S. *Principles of Corporate Finance*, McGraw-Hill, New York, (1996), Chapter 5. See also Mishan, E.J. and Quah, E. *Cost-Benefit Analysis*, 5<sup>th</sup> ed., Routledge, London and New York, (2007) at 142-143.

<sup>37</sup> This problem may be more likely to arise if cash flows may take on positive and negative values during the life of a project. See, for example, Brealey, R. and Meyers, S. *Principles of Corporate Finance*, McGraw-Hill, New York, (1996), at 96.

**Q26. WHAT OTHER FACTORS COME INTO PLAY WHEN APPLYING THESE  
ANALYTICAL TOOLS IN A BUSINESS CASE ANALYSIS?**

**A26.** It is also important that a reasonable time horizon be established for a project, one that is consistent with the expected useful life of the investment. In addition care must be taken to identify benefits and costs associated with projects. It also makes sense to perform sensitivity analysis that alters assumptions to account for the impact of unexpected events, or to explore "what if" scenarios that may emerge either during or following the deployment of a project.

**Q27. WHAT ANALYTICAL TOOLS DID DEO APPLY TO THE AMR PROJECT?**

**A27.** The analytical approach undertaken by DEO separately applied the three tools discussed above NPV, IRR, and payback analysis.<sup>38</sup> In addition, DEO developed a sensitivity analysis for the scenarios considered, and altered some assumptions associated with its evaluation of the various scenarios.

DEO formally evaluated three alternative AMR deployment options in its business case.<sup>39</sup> The first option included the full deployment of the AMR equipment to all meters, using Itron ERT (encoder, receiver transmitter) devices. The second option also relied on the use of Itron ERT devices, and included the deployment of AMR for all inside meters, and for the approximately 111,000

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<sup>38</sup> DEO also reported the impact of the alternative projects on net income, for both the first year, and for a "steady state" scenario following full deployment.

<sup>39</sup> According to Mr. Armstrong, DEO also considered other scenarios that were eliminated prior to the Business Case Team applying the business case analytical tools. Armstrong Deposition Transcript at 77-78.

1 outside meters that were located in close proximity to the inside meters. The third  
2 option, relied on Hexagram Star Network MTU devices, and also was based on  
3 the assumption of the replacement of all inside meters, and the 111,000 "close  
4 proximity" outside meters.

5  
6 **Q28. DEO HAS UTILIZED NPV, AS WELL AS IRR AND PAYBACK ANALYSIS.**  
7 **DOES THAT CREATE A PROBLEM?**

8 **A28.** No, as long as the strengths and weaknesses of each measure are recognized.

9  
10 **Q29. IN YOUR OPINION, WAS THE ANALYSIS OF THE AMR DEPLOYMENT**  
11 **OPTIONS REASONABLY CONDUCTED?**

12 **A29.** In general, yes. The analysis identified a broad range of factors that could impact  
13 DEO's operations given the deployment of the AMR system, ranging from  
14 assumptions regarding the costs of meter installation, meter maintenance, ERT  
15 device failure rates, and the number of AMR reads per route.<sup>40</sup> In addition, the  
16 study was conducted using two sensitivity scenarios, one "conservative" and one  
17 "aggressive." With these sensitivity scenarios, the study altered some  
18 assumptions and generated a range of results. Because the analysis performed by  
19 DEO includes a broad range of factors, and employs a sensitivity approach, it  
20 appears to be the type of study that would reasonably inform DEO's management  
21 regarding the options associated with the AMR project.

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<sup>40</sup>DEO response to OCC Request For Production No. 160 (Attachment TRR-8), "CONFIDENTIAL DOCUMENT - Gas AMR Business Case Presentation (March 21) .ppt" at 15.

1 DEO's business case evaluation also applied an approach that reflected the  
2 Company's capital budgeting process across all of Dominion's business units.<sup>41</sup>  
3 DEO referred to this as an "unlevered" approach. In standard financial analysis,  
4 an unlevered analysis treats the project as if it were an independent firm that is  
5 financed strictly by equity.<sup>42</sup> NPVs and IRRs were calculated by DEO using the  
6 unlevered assumption. This unlevered approach offers a basic gauge of whether a  
7 project will add value to a firm. DEO's approach also applied a "levered"  
8 analysis that is based on the capital structure of the individual business unit.<sup>43</sup>  
9

10 It should be noted that while the levered and unlevered approaches will generate  
11 different values for the various scenarios considered, the relative ranking of the  
12 projects are likely to remain unchanged. A project that ranks the highest in the  
13 unlevered approach should also rank the highest in the levered approach.  
14

15 **Q30. WHAT DID DEO'S BUSINESS CASE ANALYSIS REVEAL?**

16 **A30.** Table 7, below, summarizes the unlevered analysis conducted by DEO.<sup>44</sup> This

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<sup>41</sup> DEO response to OCC Interrogatory No. 517 (Attachment TRR-1).

<sup>42</sup> See, for example, Brealey, R. and Meyers, S. *Principles of Corporate Finance*, McGraw-Hill, New York, (1996) at 526.

<sup>43</sup> Armstrong Deposition Transcript at 157.

<sup>44</sup> Data in Table 7 from DEO response to OCC Request For Production No. 160 (Attachment TRR-8), "CONFIDENTIAL DOCUMENT - Gas AMR Business Case Presentation (March 21) .ppt" at 9.



unlevered approach would allow DEO to evaluate the AMR deployment within the capital budgeting context of Dominion's overall operations.<sup>45</sup>

Table 7: Financial Summary of DEO's Unlevered AMR Business Case Analysis (Each Case Assumed 3-Year Installation)				
Option	Deployment Cost (Millions)	Unlevered IRR	Unlevered NPV (9.4 percent; 15 Yrs.)	Payback (Years)
Full Deployment; 1.3 Million Meters (Aggressive Assumptions).	\$94.8	12.32 percent	10,980,926	7
Full Deployment; 1.3 Million Meters (Conservative Assumptions).	\$102.8	9.18 percent	(868,013)	7.6
Partial Deployment (Itron), All 560,000 Inside meters, plus 111,000 Outside Meters (Aggressive Assumptions).	\$59.5	22.27 percent	22,690,245	2.4
Partial Deployment (Itron), All 560,000 Inside meters, plus 111,000 Outside Meters (Conservative Assumptions).	\$65.4	17.40 percent	18,436,996	4.7
Partial Deployment (Hexagram), All 560,000 Inside meters, plus 111,000 Outside Meters (Conservative Assumptions).	\$85.1	11.08 percent	5,524,764	5.9

<sup>45</sup>In standard financial analysis, an unlevered approach orients the analysis to consider the proposed project as a "mini-firm," and to determine whether the project would yield a market value that would be consistent with its viability. The logic of this approach relates the discounted cash flow associated with a project to identify the source of potential dividend payments, thus, the evaluation of the project using this approach reproduces the process by which common stock of an independent entity pursuing the project would be valued by capital markets. See, for example, Brealey, R. and Meyers, S. *Principles of Corporate Finance*, at Chapter 5.

1 DEO's analysis showed that each of the three decision criteria applied by DEO  
2 demonstrated that the full AMR deployment option is generally inferior to the  
3 partial deployment option. The results also showed that the partial deployment of  
4 the Hexagram AMR was inferior to the partial deployment of the Itron AMR. As  
5 DEO ultimately selected an Itron deployment, its rejection of the Hexagram  
6 option supported by this analysis, however, its selection of the full deployment of  
7 the Itron system is not.

8  
9 When considering the results for the Itron deployment alternatives, focusing first  
10 on the NPV results, in the conservative assumption case, the NPV for full  
11 deployment is negative, indicating that the project is not cost effective.<sup>46</sup> With the  
12 aggressive assumption, that is the AMR deployment would benefit from the most  
13 positive possible deployment, the NPV of the full deployment option is positive,  
14 but it is lower than the NPV of either scenario associated with the partial  
15 deployment option by a substantial margin. Similarly, with the IRR analysis, the  
16 IRR values associated with the full deployment option are substantially lower  
17 than the partial deployment options. The full deployment option with the  
18 conservative assumptions reports an IRR value of less than Dominion's weighted  
19 average cost of capital used in the planning exercise (9.4 percent), also pointing to  
20 the undesirable nature of the project. Finally, the Payback analysis shows that the

---

<sup>46</sup> Mr. Armstrong noted in his deposition that the "aggressive" assumptions employed in the business case analysis assumed the best of all possible worlds. Mr. Armstrong also stated that the Steering Committee to which the Business Case Team reported did not utilize the aggressive case assumptions in its presentation of business case results to senior management. Armstrong Deposition Transcript at 67-68.

full deployment option has substantially longer payback periods than does the partial Itron deployment option. However, the data in Table 7 shows that the partial Itron deployment is superior to each of the other options evaluated.

**Q31. WHAT DO THE RESULTS OF DEO'S LEVERED ANALYSIS SHOW?**

**A31.** Table 8, shows the results of the business case analysis using a levered approach.

With the levered approach, the DEO's capital structure is utilized in the analysis.

Table 8: Financial Summary of DEO's AMR Levered Business Case Analysis (Each Case Assumed 3-Year Installation)				
Option	Deployment Cost (Millions)	Levered IRR	Levered NPV (9.4 percent; 15 Yrs.)	Payback (Years)
Full Deployment; 1.3 Million Meters (Aggressive Assumptions).	\$94.8	19.99 percent	19,695,325	7
Full Deployment; 1.3 Million Meters (Conservative Assumptions).	\$102.8	14.12 percent	9,004,105	7.6
Partial Deployment (Itron), All 560,000 Inside meters, plus 111,000 Outside Meters (Aggressive Assumptions).	\$59.5	47.06 percent	31,986,764	2.4
Partial Deployment (Itron), All 560,000 Inside meters, plus 111,000 Outside Meters (Conservative Assumptions).	\$65.4	33.74 percent	23,782,095	4.7
Partial Deployment (Hexagram), All 560,000 Inside meters, plus 111,000 Outside Meters (Conservative Assumptions).	\$85.1	17.93 percent	13,301,389	5.9

1 It can be seen in Table 8 that while the NPV and IRR values have increased as a  
2 result of the introduction of DEO's capital structure, the relative positions of the  
3 projects do not change. The partial deployment of the Itron system is again the  
4 superior alternative.

5  
6 **Q32. WHAT DOES THE INFORMATION IN TABLES 7 AND 8 INDICATE?**

7 **A32.** The information shows that as a general proposition, the Itron deployment appears  
8 to have offered the potential for outcomes superior to that offered by the  
9 Hexagram deployment. However, it is also very clear that between the two Itron  
10 deployment scenarios evaluated by DEO, the partial deployment option is  
11 superior by a wide margin. The results of the analysis strongly favor the partial  
12 deployment option. Focusing on the NPV results, DEO's analysis indicates that  
13 the full deployment will result in higher deployment costs and lower net benefits.  
14 Table 9, below, indicates that as a result of DEO's decision to pursue full  
15 deployment, net benefits will be reduced by a substantial amount. This reduction  
16 in net benefits will ultimately impact ratepayers, as DEO's own analysis indicates  
17 that DEO is making a less than optimal choice. Ratepayers will pay higher rates  
18 than those that DEO could have achieved if it had selected a partial deployment  
19 plan.

1

Table 9: Net Benefits Foregone		
Scenario	Net Benefits Foregone (Aggressive Assumptions)	Net Benefits Foregone (Conservative Assumptions)
Full Deployment Selected Instead of Partial Deployment (Levered Case)	\$12,291,439	\$14,777,990
Full Deployment Selected Instead of Partial Deployment (Unlevered Case)	\$11,709,319	\$19,305,009

2

3 **Q33. THE ANALYSIS CONTAINED IN TABLES 6 AND 7 ASSUMES A 3-**

4 **YEAR DEPLOYMENT SCHEDULE FOR THE AMR PROJECT. DEO**

5 **HAS ADOPTED A 5-YEAR DEPLOYMENT SCHEDULE. WILL**

6 **THIS DIFFERENCE HAVE ANY IMPACT ON THE OUTCOME?**

7 **A33.** DEO's three-year deployment plan assumed that the AMR system would be

8 deployed using contract labor.<sup>47</sup> DEO's 5-year deployment schedule reflects the

9 use of DEO personnel, and will increase the deployment costs by \$4 million.<sup>48</sup>

10 Under the 5-year deployment schedule adopted by the Company there will be no

11 change in nominal benefits.<sup>49</sup> As a result of the higher deployment costs alone

12 (given no change in the nominal benefits), the business case values associated

13 with the full deployment option will become less favorable. However, the timing

<sup>47</sup> Armstrong Deposition Transcript at 135-137.

<sup>48</sup> Armstrong Deposition Transcript at 140-141.

<sup>49</sup> Armstrong Deposition Transcript at 141.

1 of the benefits of AMR deployment will change, and benefits may take longer to  
2 emerge. While the Company initially planned to target the hard-to-read indoor  
3 meters first, because it has adopted a shop-by-shop approach to AMR  
4 deployment, it is possible that some indoor meters may not be replaced until years  
5 four and five of the deployment program.<sup>50</sup> This indicates that the benefits of the  
6 remote meter reading will be delayed, and the business case associated with full  
7 deployment will be even less favorable as a result.

8  
9 ***Q34. DOES DEO'S SELECTION OF THE FULL DEPLOYMENT OPTION,***  
10 ***GIVEN ITS INFERIOR NPV, RESULT IN A REASONABLE OUTCOME***  
11 ***FOR RATEPAYERS?***

12 ***A34.*** No. It is reasonable to consider the expected behavior of firms in competitive  
13 markets when evaluating DEO's decision. In a competitive market, firms do not  
14 pursue projects that have negative NPVs, and would be expected to select those  
15 projects that generate the highest NPV as this will have a superior impact on the  
16 firm's value and viability. However, DEO does not operate in a competitive  
17 market, and DEO may have incentives to over-invest in capital, as it can earn a  
18 return on that capital once it is included in its rate base. It has long been  
19 recognized that firms operating under rate-of-return regulation may have  
20 incentives to substitute capital for labor in a manner that would not occur in a

---

<sup>50</sup>In an October 3, 2006 presentation to Staff on the AMR deployment, DEO indicates that it will focus initially on inside meters ("Dominion East Ohio MGSS Meter Reading Discussion," October 3, 2006.) Provided in response to Blue Ridge MTD 03-02 Data Request a-d, i (Attachment TRR-2). However, DEO later shifted its focus to a shop-by-shop conversion. See, "Dominion East Ohio Meter Reading Plan," (July 20, 2007) at 1.

1 competitive market.<sup>51</sup> DEO's selection of the full deployment option appears to  
2 be consistent with this outcome.

3

4 **Q35. DO YOU AGREE WITH, MR. ARMSTRONG'S CLAIM THAT IN SPITE OF**  
5 **THE INFERIOR BUSINESS CASE OUTCOMES ASSOCIATED WITH THE**  
6 **FULL DEPLOYMENT, DEO BELIEVES THAT THE FULL DEPLOYMENT**  
7 **OPTION IS THE BEST CHOICE?**<sup>52</sup>

8 **A35.** Mr. Armstrong argued that if the AMR is deployed to anything less than all  
9 customers, then two classes of customers will be created -- one with AMR and  
10 one without. While this certainly would be the outcome if the partial deployment  
11 option were deployed, there is no *a priori* reason to believe that a partial  
12 deployment would disadvantage customers that have outdoor meter placements.  
13 The Commission has identified customer service standards associated with the  
14 MGSS. These standards were designed to provide a reasonable level of customer  
15 service, but they certainly do not instruct utilities to provide the "ultimate" level  
16 of customer service. Compliance with the MGSS will generate costs that  
17 ultimately must be borne by ratepayers. The Commission should require  
18 companies to comply with these standards, but there is no good reason to  
19 encourage over-compliance as over-compliance unnecessarily adds to the monthly  
20 bills paid by consumers. DEO's AMR proposal represents significant over-

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<sup>51</sup>The seminal work on this issue is "H. Averch and L. Johnson. "The Behavior of the Firm Under Regulatory Constraint," *American Economic Review*, Vol. 52, No. 5 (December 1962) at 1052-1069.

<sup>52</sup> Armstrong Deposition Transcript at 143.

1 compliance. DEO has not quantified the alleged negative impact of some  
2 customers having AMR deployed, while others do not. As a result, DEO's  
3 business case analysis provides the only study of the impact the deployment of  
4 AMR, and this study shows that full deployment is the inferior alternative. OCC  
5 witness Williams further discusses the AMR deployment in the context of  
6 customer service issues.

7  
8 ***Q36. DOES THE STAFF REPORT ADDRESS THE BUSINESS CASE OF***  
9 ***DEO'S AMR DEPLOYMENT?***

10 ***A36.*** No. However, it should be noted that the Staff Report frames the evaluation of  
11 the AMR program in the context of the benefits of the project for indoor meter  
12 placements:

13 Because about half a million of DEO's customers have gas meters  
14 located inside the customer premises, Staff agrees that AMR  
15 technology is a cost effective way to achieve more frequent actual  
16 meter readings and avoid inconveniencing these customers. AMR  
17 technology would virtually eliminate the very labor intensive  
18 process to gain access and read meters located inside a customer's  
19 premise.<sup>53</sup>

20  
21 Staff is correct that the application of AMR to address the problem presented by  
22 indoor meters is a cost effective approach, DEO's analysis demonstrates that

---

<sup>53</sup>Staff Report at. 42.



1 under the deployment assumptions modeled by DEO that replacement of indoor  
2 meters generates higher, positive, NPVs. However, DEO's analysis also  
3 demonstrates that the replacement of all meters with AMR is an inferior choice.  
4 Staff's analysis ignores this fact.  
5

6 ***Q37. HOW DO YOU PROPOSE THAT DEO'S AMR DEPLOYMENT BE***  
7 ***TREATED?***

8 ***A37.*** DEO has decided to incur higher deployment costs than its own business case can  
9 justify. DEO is asking ratepayers to support an investment level that is  
10 approximately \$45 million higher than the level that DEO's analysis indicates is  
11 optimal.<sup>54</sup> As a result, DEO ratepayers will face higher rates in the future, and  
12 DEO will be able to earn additional return on investment as a result of the larger  
13 rate base. DEO's ratepayers should be held harmless from DEO's decision to  
14 pursue a full deployment of AMR technology, when a partial deployment was  
15 revealed by DEO's own analysis to be superior. The Commission should not  
16 allow \$45 million associated with the AMR project into rate base. In addition, the  
17 AMR cost recovery charge should be adjusted to reflect the reduction in the  
18 allowed investment.  
19

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<sup>54</sup> According to DEO's business case analysis, the partial deployment option targeting inside meters, and 111,000 outside meters that were in close proximity to the inside meters has a deployment cost of \$65.4 million. DEO's current projection for the full deployment identifies a deployment cost of \$110 million.

1 VI. CONCLUSION

2 **Q38. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?**

3 **A38.** Yes, it does. However, I reserved the right to update this testimony based  
4 on responses to discovery that DEO has failed to provide OCC as of the  
5 filing date, specifically, materials requested by OCC Request For  
6 Production No. 170 that were identified in Mr. Murphy's deposition as not  
7 having been provided to OCC.

8

*Direct Testimony of Trevor R. Roycroft, Ph.D.  
On Behalf of the Office of the Ohio Consumers' Counsel  
PUCO Case No 07-829-GA-AIR et al.*

**Exhibit A**

**Dr. Roycroft's Vita**

**Trevor R. Roycroft**  
51 Sea Meadow Lane  
Brewster, MA 02631  
508-896-0151  
trevor@roycroftconsulting.org  
www.roycroftconsulting.org

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## **Education**

Ph.D., Economics, University of California, Davis, 1989.  
M.A., Economics, University of California, Davis, 1986.  
B.A., Economics, with honors, California State University, Sacramento, 1984.

## **Ph.D. Fields of Specialization**

Industrial Organization and Regulation  
Public Finance  
Economic History

## **Experience**

Independent Consultant, June 1994 to present. Provides economic and policy research and analysis for clients. Presents expert testimony in state and federal venues. Performs economic and statistical studies of market conditions. Evaluates economic and policy issues in public utility, telecommunications, and information technology industries. Develops economic and policy recommendations. Matters addressed include pricing plans, market structure analysis and competition, alternative regulatory frameworks, productivity growth, service quality, cost calculations, cost allocation, cost modeling, network unbundling, capital costs, wireless markets, economic damages, and broadband policy.

Lecturer, Fall 2006. Telecommunication Systems Management program in the Graduate School of Engineering at Northeastern University, Boston, MA. Conducts graduate seminar titled "Perspectives on Telecommunications Policy: Governments, Markets, and Technological Change."

Associate Professor, J. Warren McClure School of Communication Systems Management, Ohio University, September 1994 to November 2004. Granted tenure, Spring 2000. Conducted graduate and undergraduate courses in regulatory policy and law, and the economics of the telecommunications industry, as well as general education courses covering telecommunications technology, markets, policy, and the social impact of communications technology. Conducted research with a focus on the telecommunications industry. Provided academic advising to graduate and undergraduate students within the school and across the university. Served on department, college, and university committees.

Interim Director, J. Warren McClure School of Communication Systems Management, Ohio University, July 2000 to June 2002. Responsibilities included: program planning, evaluation, and assessment; recruiting faculty and staff; managing fiscal resources; administering the School's curriculum; and establishing and maintaining relationships with internal and external constituencies of the school.

## **Experience (continued)**

Chief Economist/Acting Chief Economist/Assistant Chief Economist/ Principal Economist, Indiana Office of Utility Consumer Counselor, May 1991 to June 1994. Conducted research and prepared testimony, cross examination, and legal briefs to be presented before the Indiana Utility Regulatory Commission in major cases involving gas, water, electric, and telecommunications utilities. Prepared analysis and comments to be presented before the Federal Communications Commission. Advised Director of Utility Analysis and the Utility Consumer Counselor on policy issues; assisted in formulation of policy. Coordinated technical analysis in major cases. Presented agency policy positions to outside groups. Supervised Economics and Finance Staff of eight professionals. Reviewed and provided extensive analysis of Economics and Finance Staff testimony.

Visiting Assistant Professor, Kenyon College, September, 1989 to May, 1991. Conducted courses in Introductory Economics (Macro and Micro), Economics of the Public Sector, Industrial Organization, and Economic Development in the Third World. Rendered college service on award and hiring committees.

Lecturer, California State University, Sacramento, Fall 1987, academic year 1988. Conducted courses in Intermediate Microeconomic Theory, Introductory Macroeconomic and Microeconomic Theory.

Teaching Assistant, University of California, Davis, 1985-1988. Assisted the professor in conducting courses in Introductory Macroeconomic Theory, Introductory Microeconomic Theory, and Public Finance.

## **Publications**

"E-Auctioning: The U.S. Federal Communications Commission and Spectrum Management." *Electronic Government: Concepts, Methodologies, Tools, and Applications*, Ari-Veikko Anttiroiko, ed. Information Science Reference, New York, 2008.

"Empirical Analysis of Entry in the Local Exchange Market: the Case of Pacific Bell." *Contemporary Economic Policy*, Vol. 23, No. 1, January 2005.

"Internet Access." Johnson, D. ed. *Encyclopedia of International Media and Communications*, Academic Press, April 2003.

"Internet Subscription in Africa: Policy for a Dual Digital Divide." (With Siriwan Anantho.) *Telecommunications Policy*, Vol. 27, Nos. 1-2, February/March 2003.

"The Impact of State and Federal Alternative Regulation Plans on the RBOCs--a State Level Analysis." in *Telecommunications for the 21<sup>st</sup> Century*. Special issue of *The International Journal of Development Planning Literature*. William Baumol and Victor Beker eds. Vol. 16, Nos. 1 & 2, January and April 2001.

"Trouble Reports as an Indicator of Service Quality: The Influence of Competition, Technology, and Regulation." (With Martha Garcia-Murrilo.) *Telecommunications Policy*, Volume 24, No. 10, November, 2000.

"The Telecommunications Act--Law of Unintended Consequences?" *Public Utilities Fortnightly*, Volume 138, No. 3, February 1, 2000.

## **Publications, Continued**

"Alternative Regulation and the Efficiency of Local Exchange Carriers--Evidence from the Ameritech States." *Telecommunications Policy*, Volume 23, No. 6, July, 1999.

"The Billy Goats Gruff. A Fairy Tale for the Third Anniversary of the Telecommunications Act of 1996."

*Info: The Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media*, Volume 1, No. 2, April, 1999.

"A Dynamic Model of Incumbent LEC Response to Entry Under the Terms of the Telecommunications Act of 1996." *Journal of Regulatory Economics*, Volume 14, November, 1998.

"Ma Bell's Legacy: Time for a Second Divestiture?" *Public Utilities Fortnightly*. Vol 136, No. 12, June 15, 1998.

"The Telecommunications Act of 1996: An Unfunded Mandate for the States." (With Phyllis Bernt.) *Central Business Review*, Volume XV, No. 2, Summer 1996.

## **Reports and White Papers**

"Reverse Auctions for Universal Service Funding?", February 1, 2008. Available at [http://www.roycroftconsulting.org/Roycroft\\_Consulting\\_Auction\\_White\\_Paper\\_2-1-08.pdf](http://www.roycroftconsulting.org/Roycroft_Consulting_Auction_White_Paper_2-1-08.pdf)

"Evaluating Telecommunications Trends: Commission Responsibilities in Evolving Markets." Policy White Paper Prepared for the Public Counsel Section of the Washington State Office of Attorney General, September 5, 2007.

"Economic Analysis and Network Neutrality: Separating Empirical Facts from Theoretical Fiction," May 2006. Available at: [http://www.freepress.net/docs/roycroft\\_study.pdf](http://www.freepress.net/docs/roycroft_study.pdf)

"Network Neutrality, Product Differentiation, and Social Welfare. A Response to Phoenix Center Policy Paper No. 24." Roycroft Consulting Policy White Paper. May 3, 2006. Available at: [http://www.roycroftconsulting.org/response\\_to\\_Ford.pdf](http://www.roycroftconsulting.org/response_to_Ford.pdf)

"Network Diversity—A Misguided Policy. A Response to Christopher S. Yoo's 'Promoting Broadband Through Network Diversity'." Roycroft Consulting Policy White Paper. March 1, 2006. Available at: [http://www.roycroftconsulting.org/response\\_to\\_Yoo.pdf](http://www.roycroftconsulting.org/response_to_Yoo.pdf)

"Wireless Consumer Protection: A Model Bill for the States." AARP Research Center, September, 2003.

"The End of Telecommunications? An Epilogue to Tangled Web: The Internet and Broadband Open Access Policy." AARP Research Center, June, 2002.  
Available at:  
<http://www.aarp.org/research/technology/internetaccess/aresearch-import-123-2002-10.html>

"Tangled Web: The Internet and Broadband Open Access Policy." AARP Research Center, January, 2001. Available at:  
<http://www.aarp.org/research/technology/internetaccess/aresearch-import-172-D17331.html>

## **Conference Papers**

"The Impact of State and Federal Alternative Regulation Plans on the RBOCs--a State Level Analysis," July 1999. Presented at the Western Economic Association International Annual Meeting, San Diego, California.

"The Billy Goats Gruff. A Fairy Tale for the Third Anniversary of the Telecommunications Act of 1996," June, 1999. Presented at the Academic Seminar at the 1999 National Cable Television Association Convention, Chicago, Illinois.

"Alternative Regulation and the Efficiency of Local Exchange Carriers--Evidence from the Ameritech States." November, 1998. Presented at the 68<sup>th</sup> Annual Conference of the Southern Economic Association, Baltimore, Maryland.

"A Dynamic Model of Incumbent LEC Response to Entry Under the Terms of the Telecommunications Act of 1996." July 1998. Presented at the Western Economic Association International Annual Meeting, Lake Tahoe, Nevada.

"Do We have the Bugs Out of Telephone Deregulation?" April 1998. Presented at the Law and Policy Division of the Broadcast Education Association, Las Vegas, Nevada.

"The Telecommunications Act of 1996 and Imposed Costs in the Local Exchange Market: A Dynamic Model of Incumbent Behavior." September 1997. Presented at the *Telecommunications Policy Research Conference*, Arlington Virginia.

"Towards an Advanced Information Infrastructure," August 1995. Presented to the National Association of Regulatory Utility Commissions' Annual Regulatory Studies Program at Michigan State University.

"Sorting, Bonding, and Barriers to Entry: Strategies of the Entry Concerned Firm," July 1990. Presented at the Western Economic Association Meetings, San Diego, California.

## **Additional Presentations**

"Economics and Network Neutrality." Presented at the 2006 Mid-year Meetings of the National Association of Utility Consumer Advocates. June 2006. Memphis, TN.

"Consumer Education and Telecommunications Competition." Presented at the 2006 Mid-year Meetings of the National Association of Utility Consumer Advocates. June 2006. Memphis, TN.

"Broadband Open Access." Presented to AARP's National Legislative Council. October, 2000. Washington, D.C.

"Telecommunications Policy, Markets, and Regulation--Who's On First?" Presented to the Maryland Office of Peoples' Counsel and Maryland Public Service Commission. October, 2000. Baltimore, MD.

"Broadband Open Access--Implications for the Internet and Consumers." November 1999. Panelist at the National Association of Utility Consumer Advocates Annual Convention. San Antonio, Texas.

### **Additional Presentations (Continued)**

"Validation of Proxy Cost Models." January 1997. Panel discussant at the Federal Communications Commission workshops on proxy cost models (CC Docket 96-45).

"Impact of the Telecommunications Act of 1996 on Telecommunications Managers." December 1996. Presented to members of the *Association of Telecommunications Professionals*. Columbus Ohio.

"Caveat emptor! Local competition, possible effects on prices and the reality of choice." October 1995. Presented at the Public Information Session on Telephone Competition. Dayton, Ohio.

"Cost Allocation in Network Industries," August 1995. Presented to the National Association of Regulatory Utility Commissions' Annual Regulatory Studies Program at Michigan State University.

"Incremental Cost Methodology in Telecommunications," June 1995. Presented to the Ohio Office of Consumers' Counsel.

"Regulatory Issues Connected with the Implementation of the Clean Air Act Amendments of 1990," August 1993. Presented at the Indiana Bar Association's Utility Law Section Summer Meetings.

"Consumer Perspectives on the Ameritech Customer's First Plan," August 1993. Presented at the Ameritech Regional Regulatory Committee Ad Hoc Working Group Meeting.

"Consumer Perspectives on Universal Telecommunications Service," December 1992. Presented at the Indiana Utility Regulatory Commission Workshops on Regulatory Flexibility in Telecommunications.

### **Honors**

Competitive paper finalist. The Academic Seminar at the 1999 National Cable Television Association Convention, Chicago, Illinois. Paper title: "The Billy Goats Gruff. A Fairy Tale for the Third Anniversary of the Telecommunications Act of 1996."

### **Courses Taught**

Perspectives in Telecommunications Policy:

Governments, Markets, and Technological Change *Northeastern University*

Competition and Market Structure in Network Industries, *Ohio University*

Communication Regulatory Policy, *Ohio University*

Applications of Common Carrier Regulation, *Ohio University*

Introduction to Common Carrier Regulation, *Ohio University*

Introduction to Communication Systems Management, *Ohio University*

Consumer Issues in Communication Systems Management, *Ohio University*

Topical Seminar (New Technologies and Telecommunication Policy), *Ohio University*

Topical Seminar (The Telecommunications Act of 1996), *Ohio University*

Special Studies in Communication Systems Management, *Ohio University*

Economics of the Public Sector, *Kenyon College*

Industrial Organization, *Kenyon College*

Economic Development in the Third World, *Kenyon College*

Intermediate Microeconomics, *California State University, Sacramento*

Microeconomic Principles, *Kenyon College; California State University, Sacramento*



## **Courses Taught (Continued)**

Macroeconomic Principles, *Kenyon College; California State University, Sacramento*

## **College and University Service**

Faculty Advisor, University College, *Ohio University*, 1998-2004  
Member, Baker Fund Committee, *Ohio University*, 2003-2004  
Member, College of Communication Curriculum Committee, *Ohio University*, 2003-2004  
Chair, College of Communication Dean's Evaluation Committee, *Ohio University*, 2003-2004  
Faculty Advisor, Communication Week, *Ohio University*, 1994-2002  
Faculty Advisor, Students in Communication Systems Management, *Ohio University*, 1994-1996  
Member, University General Education Review Committee, *Ohio University*, 1998-1999  
Member, College of Communication Curriculum Committee, *Ohio University*, 1998-2000  
Member, College of Communication Graduate Committee, *Ohio University*, 1997-2002  
Member, University Calendar Review Task Force, *Ohio University*, 1996-1997  
Member, Outstanding Civil Service Award Committee, *Ohio University*, 1995-1996  
Member, Mathematics Department Search Committee, *Kenyon College*, 1990-1991  
Member, Williams Memorial Award Committee, *Kenyon College*, 1989-1991

## **Professional Membership**

American Economic Association

## **Ph.D. Dissertation Supervision**

"The Examination of Strategic Interactions in One Local Access Telephone Market, the Effects on Expected Price for Access and Universal Access." Judith Ann Molka-Danielsen. School of Information Sciences, Telecommunications Program, University of Pittsburgh, 1998.

## **Referee Service**

*Journal of Regulatory Economics*  
*Telecommunications Policy*  
*Southern Economic Journal*  
*Social Science Computer Review*  
*Utilities Policy*  
*Journal of Economic Studies*  
*Communications of the Association for Information Systems*

## **Expert Testimony Presented**

### **California (On behalf of The Utility Reform Network [TURN])**

<b><u>CPUC Cause No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
Rulemaking 05-04-005 (March 30, 2007)	Order Instituting Rulemaking to Assess and Revise Regulation of Telecommunications Utilities	Post-deregulation monitoring.
Rulemaking 06-06-028 (October 16, 2006)	Review of the California California High Cost Fund B Program	Approaches to Calculating High Cost Funding.
Rulemaking 06-05-028 (September 15, 2006)	Review of Telecommunications Public Policy Programs	Affordability of Basic Service.
Application: 05-04-020 (August 15, 2005)	Verizon/MCI Merger	Market Structure and Market Power.
Rulemaking 05-04-005 Direct Declaration (May 31, 2005) Reply Declaration (September 2, 2005)	Order Instituting Rulemaking to Assess and Revise Regulation of Telecommunications Utilities	Local exchange Competition and Policy.
Applications: 01-02-024, 01-02-035 02-02-031, 02-02-032 02-02-034, 02-03-002 (February 7, 2003) Reply Declaration (March 12, 2003) Rebuttal Declaration	Review of UNE Rates	TELRIC Compliance of UNE Rates. Progress of local exchange competition.
Rulemaking 93-04-003 Investigation 93-04-002 (Phase II) (July, 2001)	Permanent Line Sharing Phase II	Pricing and Cost Allocation for the High Frequency Portion of the Local Loop in the NGDLC Environment.

**California (On behalf of The Utility Reform Network [TURN]) Continued.**

<b><u>CPUC Cause No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
Rulemaking 93-04-003 Investigation 93-04-002 (Phase I) (June, 2001)	Permanent Line Sharing Phase I	Pricing and Cost Allocation for the High Frequency Portion of the Local Loop.

**Canadian Radio-Television and Telecommunications Commission  
(On Behalf of Action Réseau Consommateur, et al.)**

<b><u>CRTC Case No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
Public Notice CRTC 2006-5 (July, 2006)	Review of Price Cap Framework	Price Cap Plan, Productivity and Advanced Services, Competition.
Public Notice CRTC 2001-37 (August, 2001)	Price Cap Review and Related Issues	Price cap regulation and productivity growth. Accommodative entry policy.

**Colorado (On behalf of AARP)**

<b><u>CPUC Docket No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
04A-411T (February, 2005)	In the Matter of Qwest Corporation Application	Analysis of local exchange market. For Service Reclassification and Deregulation.

**Indiana (On behalf of the AARP and Citizens Action Coalition of Indiana)**

<b><u>IURC Cause No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
42405 (October, 2003)	SBC Indiana's Request for Alternative Regulation	Analysis of local competition, Price Cap Regulation and Productivity.
41911 (July, 2001)	Commission's Investigation of Ameritech Indiana Service Quality	Service Quality Performance.
40785-S1, 40849, 41058 (January, 2001)	Approval of Settlement Agreement between Ameritech and other Parties	Alternative Regulation, Advanced Services Deployment, Service quality, Alternative Regulation.

**Indiana (On behalf of the AARP and Citizens Action Coalition of Indiana) (Continued)**

<b><u>IURC Cause No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
41058 (August, 2000)	Agreement between Ameritech And other Parties	Cost of Service, Cost Modeling, Compliance with §254(k) of the Telecommunications Act of 1996.
40785-S1 (September, 1999)	Commission's Investigation Ameritech Indiana's Compliance With Section 254(k) of the Telecommunication Act	Economic Cost of Service/ Cost Allocation.
40849 (November, 1997)	Commission's Own Motion On Ameritech Indiana's Request for Interim Relief	Interim and Permanent Alternative Regulation/Rate Design.
40849 (September, 1997)	Ameritech Indiana Request for Interim Relief	Interim Alternative Regulation/Rate Design.

**Kansas (On behalf of the Citizens' Utility Ratepayer Board [CURB])**

<b><u>KCC Docket No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
05-SWBT-997-PDR (May, 2005)	In the Matter of SWBT's Application for Price Deregulation of Certain Residential and Business Services	Analysis of local exchange market.

**Maryland (On behalf of the Maryland People's Counsel)**

<b><u>MPSC Docket No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
8730 (Rebuttal Testimony) (November, 1996)	Bell Atlantic ISDN Tariff Proposal	ISDN pricing and cost of service.
8730 (Direct Testimony) (October, 1996)	Bell Atlantic ISDN Tariff Proposal	ISDN pricing and cost of service.

**Maryland (On behalf of the Maryland People's Counsel) (Continued)**

<b><u>MPSC Docket No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
8715 (Rebuttal Testimony) (April, 1996)	MCI Request for Alternative Regulation for Bell Atlantic Maryland	Price Cap Regulation, Cost Allocation and Loop Cost Recovery.
8715 (Direct Testimony) (March, 1996)	MCI Request for Alternative Regulation for Bell Atlantic Maryland	Price Cap Regulation, Cost Allocation and Loop Cost Recovery.

**Ohio (On behalf of the Ohio Consumer's Counsel)**

<b><u>PUCO Case Nos.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
06-1013-TP-BLS (October, 2006)	AT&T Ohio Request for Alternative Regulation For Basic Local Exchange	Competition for Basic Local Exchange Service.
06-1002-TP-BLS (September, 2006)	Cincinnati Bell Request for Alternative Regulation For Basic Local Exchange Service	Competition for Basic Local Exchange Service.
05-13050TP-ORD (December, 2005) (March, 2006)	Implementation of H.B. 218 Concerning Alternative Regulation of Basic Local Exchange Service.	Existence of entry barriers. Appropriate competitive test.
02-1280-TP-UNC (May, 2004)	SBC Ohio's TELRIC Costs for Unbundled Network Elements	TELRIC cost modeling, Local Competition.
98-1082-TP-AMT (December, 1998)	SBC/Ameritech Request for Approval of Merger	Sharing of cost saving. Total factor productivity growth.
96-899-TP-ALT (December, 1997)	Cincinnati Bell Alternative Regulation	Price Cap Regulation/ Rate Rebalancing/ Rate Design.

**Ohio (On behalf of the Ohio Consumer's Counsel, continued.)**

<b><u>PUCO Case Nos.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
94-2019-TP-ACE (May, 1995)	MFS INTELENET	Financial, Managerial, and Technical Ability to Provide Local Exchange Service.
93-487-TP-ALT and 93-576-CSS (September, 1994)	Ohio Bell: Alternative Regulation	Incremental Costs/ Fully Distributed Costs/ Alternative Regulation.

**Virginia (On behalf of Consumer Counsel Section of the Virginia Office of Attorney General)**

<b><u>SCC Docket No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
PUC-2007-00008 (June, 2007)	Verizon Petition for Deregulation and Detariffing	Local Exchange Competition; Market Analysis.

**Washington (On behalf of Public Counsel Section of the Washington Attorney General)**

<b><u>WUTC Docket No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
UT-050814 (September, 2005)	Verizon/MCI Merger	Market Structure and Market Power. Merger Conditions.

**Indiana (On behalf of the Indiana Consumer Counselor).**

<b><u>IURC Cause No.</u></b>	<b><u>Title</u></b>	<b><u>Topic</u></b>
40611 (June, 1997)	Ameritech Indiana Approval of Statement of Generally Available Terms	Analysis of TELRIC studies.
39853 (March, 1994)	Teleport Communications Group of Indiana, Inc.	Authority to provide intraLATA and interLATA Private Line Services.
39705 (January, 1994)	Indiana Bell Telephone	Alternative Regulation/ Competition/Infrastructure Deployment/Imputation.
39474 (May, 1994)	Indiana Payphone Association v. Indiana Bell Telephone	Imputation/separate subsidiary.

**Indiana (On behalf of the Indiana Consumer Counselor).**

**\*Testimony prepared, but not filed due to case settlement.**

<u><b>IURC Cause No.</b></u>	<u><b>Title</b></u>	<u><b>Topic</b></u>
39755 (September, 1993)	GTE North Inc./GTE Intelligent Network Service Inc.	Divestiture of Assets/Policy.
39718 (August, 1993)	Ameritech Advanced Data Services	Affiliate Relationships.
39475 (March, 1993)	Indiana Payphone Association	Dial-Around Compensation.
38269-S4 (February, 1993)	IntraLATA Toll Compensation	Toll Rate Deaveraging.
39369 (February, 1993)	IURC Investigation into Access Charge Parity	Access Charge Parity/Recovery of Non-Traffic-Sensitive Costs/Policy.
39618 (January, 1993)	IURC Investigation into Special Access Collocation	Collocation Policy.
39385 (October, 1992)	Indiana Bell Telephone: Competition and Pricing Flexibility	Evaluation of Competition in Dedicated Communications Market/Policy.
39353*	Indiana Gas Company	Temperature Normalization Tracker/Demand Side Management/Reproduction Cost of Rate Base/Capital Costs.
39314 (September, 1992)	Indiana Michigan Power Co.	Clean Air Act Amendments /Demand Side Management.
39221 (January, 1992)	American Telecommunications Corporation	Financial Viability.
39215 (January, 1992)	Indiana American Water Co.	Reproduction Cost of Rate Base/Capital Costs.
39166 (November, 1991)	Indiana Cities Water Co.	Reproduction Cost of Rate Base/Capital Costs.
39164/39165 (October, 1991)	Ohio Valley Gas Corp.	Reproduction Cost of Rate Base/Capital Costs.

**Indiana (On behalf of the Indiana Consumer Counselor, Continued).**

**\*Testimony prepared, but not filed due to case settlement.**

<u><b>IURC Cause No.</b></u>	<u><b>Title</b></u>	<u><b>Topic</b></u>
39017*	IURC Investigation into Indiana Bell Earning	Reproduction Cost of Rate Base/Capital Costs.

**Comments Filed**

**Federal Communications Commission (On Behalf of AARP)**

In the Matter of High-Cost Universal Service Support Federal-State Joint Board on Universal Service, WC Docket No. 05-337; CC Docket No. 96-45 (Universal Service Reform and Reverse Auctions). Assisted AARP with preparation of Comments (Filed April 17, 2008), and Reply Comments (Filed June 2, 2008).

**California Public Utilities Commission (On Behalf of TURN)**

Order Instituting Rulemaking into the Review of The California High Cost Fund B Program. (Auctions for Universal Service Funding. With Regina Costa and Christine Mailloux. November 9, 2007.)

**Federal Communications Commission (On Behalf of Consumer Federation of America, Consumers Union, Free Press, US PIRG).**

In the Matter of Broadband Industry Practices. WC Docket No. 07-52. (Supporting documents attached to Comments. June 15, 2007.)

**Federal Communications Commission (On Behalf of Consumer Federation of America, Consumers Union, Free Press, US PIRG).**

In the Matter of AT&T Inc. and BellSouth Corporation Applications for Approval of Transfer Of Control, WC Docket No. 06-74. (June 6, 2006.) With Mark Cooper.

**Federal Communications Commission (On Behalf of National Association of Utility Consumer Advocates)**

In the Matter of Federal-State Joint Board on Universal Service, CC Docket 96-45. Affidavit addressing application of forward-looking economic cost methodology to rural ILECs with 100,000 or more access lines. (December 14, 2004.)

**Federal Communications Commission (On behalf of AARP)**

In the Matter of High-Cost Universal Service Support; Federal-State Joint Board on Universal Service, WC Docket No. 05-337, CC Docket No. 96-45. Assisted AARP with preparation of Comments, filed April 17, 2008, and Reply Comments, filed June 2, 2008.



## **Comments Filed (Continued)**

### **Federal Communications Commission (On behalf of AARP)**

In the Matter of Inquiry into High-Speed Access to the Internet Over Cable and Other Facilities. GN Docket No. 00-185, FCC No. 00-355. "Tangled Web: The Internet and Broadband Open Access Policy." (January 10, 2001).

### **Indiana Utility Regulatory Commission (On behalf of the Indiana Consumer Counselor)**

A Comprehensive Approach to Local Exchange Competition in Indiana (October, 1995).

### **Indiana Utility Regulatory Commission (On behalf of the Indiana Consumer Counselor)**

Comments of the Office of the Office of Utility Consumer Counselor to the Telecommunications Regulatory Flexibility Committee (1993).

### **New York Public Service Commission (On behalf of Independent Telephone Companies [NYNEX and Rochester excluded])**

Proceeding on Motion of the Commission to Examine Issues Related to the Continued Provision of Universal Service and to Develop a Regulatory Framework for the Transition to Competition in the Local Exchange Market: "Comments on Compensation Arrangements Related to Module 2" (April, 1995).

### **Maine Public Service Commission (On behalf of Independent Telephone Companies [NYNEX excluded])**

Inquiry Into the Provision of Competitive Telecommunications Services (Chapter 280), Docket 94-114: "Reply Comments to the 'Preliminary Proposal for a Revision and Restructuring of the Access Charge Provision of Chapter 280'" (June, 1995).

### **Federal Communications Commission (On behalf of the Indiana Consumer Counselor)**

Comments of the Indiana Office of Utility Consumer Counselor on the Ameritech Customers First Plan (1993).

Reply Comments of the Indiana Office of Utility Consumer Counselor on the Ameritech Customers First Plan (1993).

## **Civil Litigation**

Jason Bond and David Lear, individually and as class representatives of those similarly situated v. Veolia Water North America Operating Services, Inc.; Veolia Water North America Operating service, LLC; and Veolia Water Indianapolis, LLC. In the Marion County, Indiana, Superior Court. Analysis and litigation support. 2008; United States District Court, Southern District of Indiana, Indianapolis Division, Affidavit, June 16, 2008.

## **Civil Litigation (Continued.)**

Baxter Air, Inc., and for all others similarly situated, Plaintiffs, v. NOS Communications, Inc., NOSVA Limited Partnership, Affinity Network, Inc., Robert A. Lichtenstein, and Joseph T. Koppy, Defendants. In the Superior Court of the State of Washington in and for the County of King. Declaration, July 2007.

Brooke Randolph and John Girad, et al, Plaintiffs, v. AT&T Wireless Services Inc., et al. Superior Court of the State of California in and for the County of Alameda, Unlimited Jurisdiction. Declaration, February 12, 2007. Reply Declaration, April 25, 2007.

Christopher W. Hesse, Plaintiff v. Sprint Spectrum L.P., Defendant. Nathaniel Olson, Plaintiff v. Sprint Spectrum L.P., et al v. Sprint Spectrum L.P. et al. United States District Court Western District of Washington at Seattle. Declaration, April 30, 2007.

Dawn M. Black, et al, Plaintiffs, v. Indiana Bell Telephone Company, Inc. d/b/a Ameriech Indiana. State of Indiana, Marion County Superior Court. Analysis and litigation support. 2006-2007.

Robert Young, et al, Plaintiffs, v. United Telephone of Indiana, Inc. d/b/a Sprint. State of Indiana, Marion County Superior Court. Analysis and litigation support. 2003-2004.

Mark Webber, et al, Plaintiffs, v. Indiana Bell Telephone Company, Inc. d/b/a Ameriech Indiana. State of Indiana, Marion County Superior Court. Analysis and litigation support. 2003-2004.

June 2008

**The East Ohio Gas Company d/b/a Dominion East Ohio**  
**Case No. 07-0829-GA-AIR**  
**Response to Data Requests**

---

**Requesting Party:**Blue Ridge Consulting

---

**Data Request Set:**3

---

**Question Number:**

MTD 03-02

**Subpart:**a-d, i

---

**Request Date:**

01/11/2008

**Due Date:**01/18/2008

---

**Topic:**AMR

---

**Question:**

With respect to the Automated Meter Reading Project referenced in the direct testimony of Mr. Murphy, DEO Exhibit 1.0, page 8, lines 4 through 7, the company states that is requesting Commission approval of other changes such as:

"The installation of automated meter reading (AMR) equipment for all of its customers over a five-year period, which will provide actual meter readings each month, along with a means to recover the depreciation, incremental property taxes and post in-service carrying costs associated with the deployment."

- a. Please identify the project id(s) / reference(s) for the AMR project
- b. Please describe the current status of the AMR project
- c. Please provide any and all management reports, project scope documents, project schedule documents, cost benefit analysis and similar documents supporting the company's decision to proceed with this project
- d. Please provide the cost incurred on this project as of date certain of the filing and cost to date
- i. Please identify the amount of plant investment that would be retired as a result of the implementation of this proceeding

---

**Answer:**

a. DEOAMR

b. As of December 31, 2007, a total of 132,490 AMR units have been deployed.

c. DEO began discussing its proposed AMR deployment plan with Staff on October 3, 2006 in the context of the Commission's minimum gas service standards.

Please see the attached files for the materials provided to Staff at the meeting and several others that occurred prior to the May 24, 2007 Commission Entry in Case No. 06-1452-GA-WVR. In that Entry, the Commission indicated that it was supportive of DEO's proposal to replace its remote meter index (RMI) devices with AMR devices and granted a five year waiver allowing the company to

treat RMI device reads as actual reads in order to provide for their replacement with AMR devices over that time frame. In May 2007, Commission Staff indicated that it would support rider recovery of the cost of deployment on all meters exclusive of Badger and American devices provided the Company (1) ramped up to a 5-year deployment rate prior to the Commission issuing a final ruling in the matter and (2) requested consolidation of the AMR cost recovery application with the rate case. At that point, the Company made a decision to proceed with the project in the manner proposed by Staff. The aforementioned Entry and Staff's acceptance of DEO's meter reading plan in which the Company referenced the 5-year deployment were the primary documents supporting the Company's decision to proceed with the project.

d. \$2.14 million as of March 31, 2007 and \$14.5 million through December 31, 2007.

i. The value of plant investments to be retired as a result of the AMR implementation is \$1,124,640 for tin case meters and \$12,142,200 for Hexagram remote reading units.

---

**Preparer Of Response:**

William Armstrong

**Date Prepared:**

01/14/2008 12:29:54 PM EST

---

**Attachments:**

Yes

**Attachment Names:**

10-03-06 MGSS Rev 2.ppt

11-29-06 MGSS Meeting.ppt

2978\_001.pdf

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**Dominion East Ohio  
Curtailment Loss**

1242143 Reg Asset - Work Force Reduction - Spec Term Benefits

Original Balance	Amortization *	Balance 3/31/2007
3,253,000.00	(2,163,403.99)	1,089,596.01
<u>1,960,000.00</u>		<u>1,960,000.00</u>
<u>5,213,000.00</u>		<u>3,049,596.01</u>
(15,791.27)		
137		
<u>(2,163,403.99)</u>		

\* Monthly amortization  
Months amortized (starting November 1995)  
Accumulated amortization 3/31/2007

# Dominion East Ohio Ohio MGSS Meter Reading Discussion

October 3, 2006



**Dominion**

# Meeting Objectives

---

- Gain a better understanding of meter reading compliance plan components
- Share DEO findings regarding remote index accuracy
- Discuss potential role for AMR in DEO's compliance plan



**Dominion**

# Meeting Agenda

---

- Meter Reading Plan Components
- Remote Index Accuracy
- Dominion Virginia Power AMR Experience
- DEO AMR “Drivers”
- DEO AMR Deployment Options
- Proposed Meter Reading Approach
- Next Steps



**Dominion**



# Meter Reading Plan Components

---

## ■ 4901:1-13(G)(2)

“Plans should include the steps, notices, and measures the company intends to take in order to read each customer’s meter at least once every twelve months.”

## ■ Page 16 of 5/16/06 Entry on Rehearing indicated that plans could address following topics:

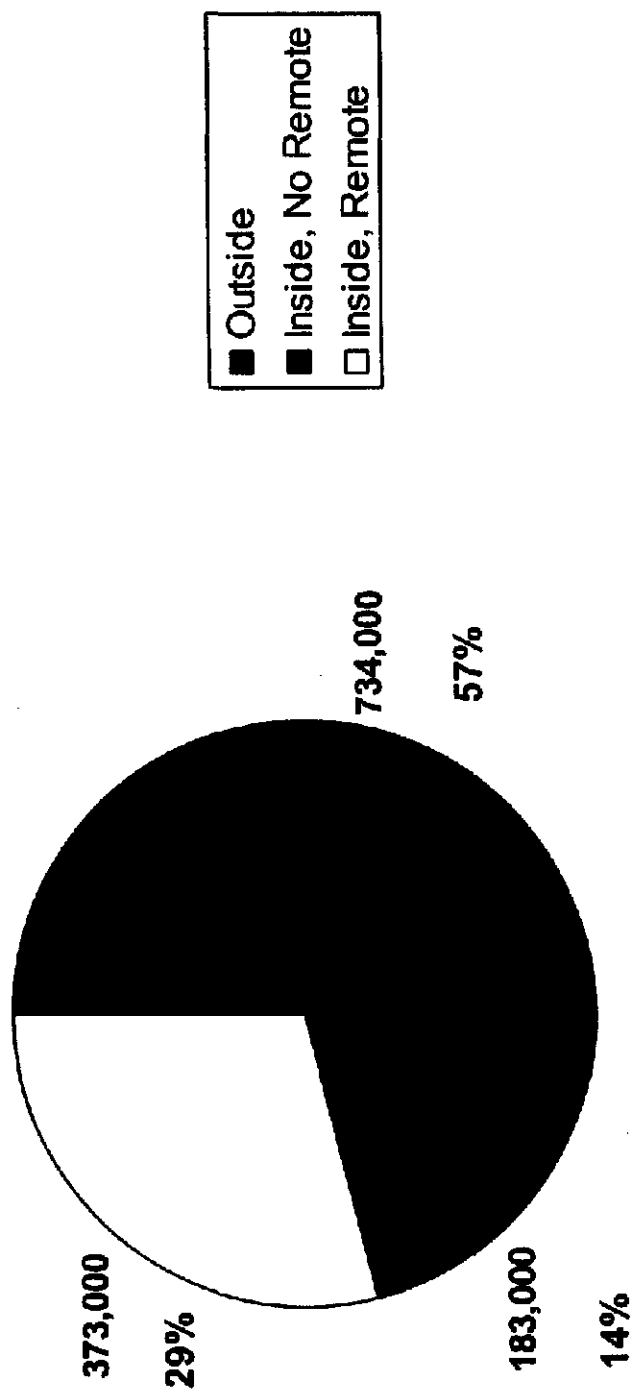
- Customer notices and escalating modes of contact
- Identifying problem areas/meter groups
- Use of special arrangements/agreements with customers
- Installing AMR technology
- Actions to be taken upon gaining access

## ■ *What do Staff and the Commissioners see as the essential ingredients in an LDC’s compliance plan?*



**Dominion**

# Location of DEO's Meters



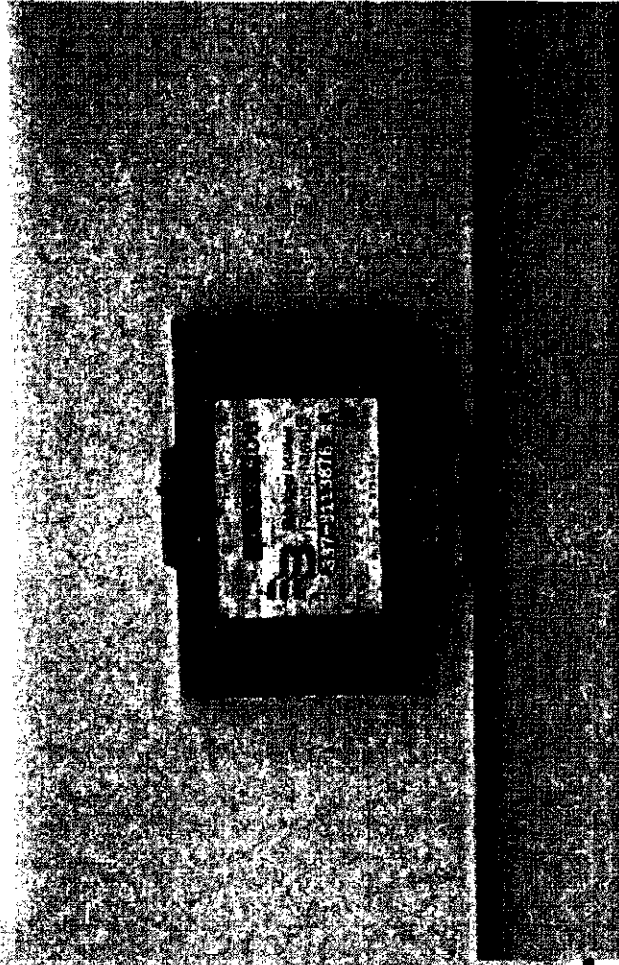
Note: Total meter population 1.3 million



**Dominion**

# Remote Meter Index Devices

---



**Badger**



**American      Hexagram**



# Remote Meter Index Accuracy Analysis

---

- Sampling Approach
  - Sampled 19,704 meters from routine service orders
  - Compared remote and actual meter readings
  - Covered period January 2005 to July 2006
  - Constituted 5.9% of the total population
- Observations
  - 13,454 exact matches (68%)
  - 987 within  $\pm 1$  MCF
  - 737  $\pm 3$  MCF
  - 67 remotes with no reading ( $<0.4\%$ )



**Dominion**

# Remote Meter Index Accuracy

Remote Type	Years Installed	Population	Defect Rate (*)
American	1977 – 1984	36,181	9.5%
Badger	1977 – 1984	18,277	21.4%
Hexagram	1986 – 2006	318,542	1.8%

(\*) Defect occurs when a remote index reading differs by more than +/- 3 Mcf from the actual meter reading over the life of the remote index.

# DEO AMR "Drivers"

---

- DEO views AMR as the most cost-effective way to comply with OH MGSS requirements on a long-term basis
- AMR enables an LDC to exceed MGSS requirements
- Value to customers of actual monthly usage is increasing due to high number of monthly variable marketer rates and PUCO approval of SSO auction results
- Ancillary benefits expected in service transfers, call center performance and customer satisfaction
- Regulatory treatment of AMR spending will determine pace of deployment



**Dominion**

# Dominion VA/NC Power AMR Project Results

---

## Deployment

- Completed full deployment of 2.2 million meters in July 2006
- Installed 1.4 million AMR devices over last 3 years
- Effective and proactive customer communications during deployment
- Few number of customer complaints during exchange process

## Customer Benefits

- Over 99.5% monthly read percentage with negligible read errors
- Steady decline in PUC complaints for high bills (down 43% in last two years)
- Dramatic reduction in PUC complaints for consecutive estimates (zero in July and August 2006)



**Dominion**

# Dominion VA/NC Power

## AMR Project Lessons Learned

---

- Proactive media and communications plan kept customers informed
- Coordination with Call Center was critical for scheduling
- Route Smart software minimized customer billing date changes
- Centralized organization helped ensure efficient and coordinated deployment
- Efficient claims process was needed to address customer complaints
- Installations of 1.5% of units were delayed due to access issues (more problems expected with inside meters)
- Contractor choice and employee training were key to quality and schedule
- QC plan for meters, AMR devices, and audits of field installations also helped
- Review of internal processes affected by AMR minimized business process disruptions



**Dominion**



# Gas AMR Technology

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- Solid-state AMR device, ERT (encoder-receiver-transmitter), records meter revolutions
- A unique ID number links AMR device to the meter
- Data is transmitted from the meter via radio frequency when "interrogated"
- Data retrieved by handheld computer or mobile drive-by collector
- AMR device is battery powered (15-20 year life)



# DEO AMR Deployment Options

---

## **DEO plans to:**

- Seek Commission approval to install AMR at customer expense on accounts that have not provided access for over 12 months after appropriate notice has been provided (Chairman Schriber suggestion)
- Prioritize replacement of Badger and American devices with AMR and replace faulty Hexagram devices with AMR as they are found

## **Major alternatives for system-wide deployment:**

1. Undertake long-term replacement program over 20 years as part of normal capital budget **OR**
2. Deploy units system-wide over 3 to 5 years, focusing initially on inside meters, in conjunction with rider recovery of depreciation, return and taxes with offset for meter reading savings as they occur



**Dominion**

# DEO AMR Deployment Options

---

## **Normal Capital Budget Option**

- Limited and scattered roll-out on new meters, scheduled meter exchanges and faulty meters
  - Bi-monthly meter reading via hand-held unit until an office is fully deployed

## **Accelerated Deployment with Recovery**

- Same as above plus system-wide deployment completed office-by-office
  - Monthly meter reading via mobile collector begins as each office is completed



**Dominion**

# Proposed Meter Reading Approach

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- Attempt to read all meters every other month
- Continue to attempt access on all outside meters and inside meters without a remote device
- Treat remote device reads as actual – willing to discuss how to address back-billing issues on accounts with faulty remote devices as part of an overall meter reading plan

# Dominion East Ohio MGSS Discussion

November 29, 2006



**Dominion**

# Meeting Objectives

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- Summarize DEO waiver requests for business processes and IT-related issues
- Discuss DEO's AMR deployment plan and cost recovery application
- Present DEO's plan to hold customers harmless for faulty remote back-billing issues
- Review any other outstanding items before DEO submits its meter access plan and related applications



**Dominion**

# Meeting Agenda

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- Planned Waiver Requests
  - Business Processes
  - IT-Related Issues
- AMR Deployment Plan
  - 5-Year Installation Plan
  - Cost Recovery Provisions
- Back-Billing Issues
- Outstanding Items
- Next Steps

# Planned Waiver Requests

## - Business Processes

### **4901:1-13-04(G)(1) – Meter Reading**

- DEO will seek a waiver to treat remote index device reads as actual meter reads in conjunction with its AMR deployment and cost recovery application and the resolution of back-billing issues as described later in this package

### **4901:1-13-05(3)(a-c) – Houseline Pressure Testing**

- DEO will seek a waiver on all houseline pressure testing, which it believes should be performed when the entire house line is completed, rather than just a portion up to an appliance drop
- The building or mechanical inspector should verify that the line was properly installed and pressure tested in accordance with International Fuel Code Section 406
- DEO will perform a leakage test (e.g., meter dial test or survey with gas detection equipment) prior to turning on gas for all new or existing house lines

### **4901:1-13-09(C) – Disconnection of Service for Fraudulent Practice**

- DEO will seek a waiver of compliance until 6/30/07 in order to complete the changes to its business practices and IT system that are needed to send the customer a written notice prior to disconnection



**Dominion**



# AMR Deployment Plan

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**Objective:** Provide more accurate usage data and monthly meter reading at the earliest possible date consistent with an economic deployment of AMR devices

- DEO is proposing a 5-year program to install ERTs on all of its 1.3 million inside and outside meters
- American and Badger replacement program will begin in 2007 Q1, along with installs on new meters, scheduled meter exchanges and any faulty meters/remotes
- If cost recovery is approved, implementation will ramp up to a 250,000 unit/year rate in 1/08
- DEO plans to move to monthly meter reading system-wide once enough meters are AMR-equipped to accommodate monthly reading on the remainder



**Dominion**

# AMR Deployment Plan

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- Major challenge will be to balance:
  1. The efficiency of a shop-by-shop conversion to AMR with
  2. An initial focus on inside meters in order to address the most pressing billing/access issues
- DEO will target the replacement of 50,000+ American and Badger units within 2 years
- DEO will consult with Staff to determine the most appropriate way to deploy AMR across its system
- DEO could also move piecemeal to monthly meter reading via mobile collector once a shop's conversion is mostly complete



**Dominion**

# AMR Cost Recovery Application

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- High-level cost estimate: < \$100/unit for total blended cost
  - ERT device (\$50/each), new meter if needed (\$50/each)
  - Labor expense associated with 45-minute meter change or less time for ERT-only installation
  - Service person will also get index read, perform DOT inspection and relight if meter is changed out
- Total system cost expected to be \$100-110 million, first-year recovery rate estimated to be \$0.25 per month per customer
- DEO will absorb cost of American and Badger replacements
- DEO will track meter reading costs, compare them to 2006 base year, and credit savings to amount to be recovered
- DEO will treat recoveries from AMR installed at customer's expense as contribution in aid of construction



**Dominion**

# Remote Index Back-Billing Issues

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*DEO will address back-billing issues associated with using remote index device reads as actuals in following manner:*

- Upon Commission approval of DEO's waiver request, DEO will hold customers harmless for any difference between actual and remote reads of 3 mcf or greater
  - When difference is less than 3 Mcf, DEO will bill the difference at the applicable rate for the current month
- When the meter shows less usage than the remote, DEO will credit the entire difference to the customer after prorating it over the period since the last actual read
- When the meter shows more usage than the remote, DEO will not back-bill for any of the incremental usage, even for that portion related to the last 12 months



**Dominion**

# Next Steps

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- Discussion of any outstanding items/issues
- In early December, DEO will finalize and submit:
  - Meter reading compliance plan
  - Applications for:
    1. AMR deployment and cost recovery
    2. Tariff changes
    3. Waiver requests
- Any further Staff input/suggestions are welcome



**Dominion**

The East Ohio Gas Company d/b/a Dominion East Ohio  
Case No. 07-0829-GA-AIR  
Response to Data Requests

---

**Requesting Party:**

PUCO

---

**Data Request Set:**

Peter Baker

---

**Question Number:**

02

---

**Subpart:**

8

---

**Request Date:**

10/17/2007

---

**Due Date:**

11/01/2007

---

**Topic:**

AMR

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**Question:**

Please adjust the AMR installation schedule (provided in the previous response) by excluding: (1) AMRs already in service as of the date certain; (2) gas meters still linked to American and Badger remote index devices as of the date certain; and (3) AMRs expected to be paid for by customers whose service is disconnected for non-access or meter tampering.

---

**Answer:**

2007 122,000 minus 18,056 installed to date minus 12,000 ROMs = 91,944  
2008 200,000 minus 28,000 ROMs, minus 7,396 paid by customer = 164,604  
2009 275,000 minus 11,825 paid by customer = 263,175  
2010 317,000 minus 13,631 paid by customer = 303,369  
2011 386,000 minus 16,598 paid by customer = 369,402

---

**Preparer Of Response:**

William Armstrong

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**Date Prepared:**

11/01/2007 03:02:56 PM EDT

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**Attachments:**

No

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The East Ohio Gas Company d/b/a Dominion East Ohio  
Case No. 07-0829-GA-AIR  
Response to Data Requests

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**Requesting Party:**

PUCO

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**Data Request Set:**

Peter Baker

---

**Question Number:**

02

---

**Subpart:**

9

---

**Request Date:**

10/17/2007

---

**Due Date:**

11/02/2007

---

**Topic:**

AMR

---

**Question:**

Utilizing data from the Company's adjusted AMR installation schedule and responses concerning the cost elements requested above, please provide an estimate of each year's total AMR cost that the Company would use as the basis for calculating the amount of its AMR Cost Recovery Charge. Include calculations demonstrating how the Company arrived at its estimated AMR costs for each year of the current installation schedule.

---

**Answer:**

Using an estimated composite cost of \$93.00 per unit, the estimated deployment costs are as follows:

2007	$91,944 \times \$93.00 = \$8,550,792$
2008	$164,604 \times \$93.00 = \$15,308,172$
2009	$263,175 \times \$93.00 = \$24,475,275$
2010	$303,369 \times \$93.00 = \$28,213,317$
2011	$369,402 \times \$93.00 = \$34,354,386$

The Company also expects to incur additional costs for customer communication and appointment scheduling that are not included above.

---

**Preparer Of Response:**

William Armstrong

---

**Date Prepared:**

11/01/2007 03:04:45 PM EDT

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**Attachments:**

No

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**The East Ohio Gas Company d/b/a Dominion East Ohio**  
**Case No. 07-0829-GA-AIR**  
**Response to Data Requests**

---

**Requesting Party:**

PUCO

---

**Data Request Set:**

Peter Baker

---

**Question Number:**

02

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**Subpart:**

13

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**Request Date:**

10/17/2007

---

**Due Date:**

11/02/2007

---

**Topic:**

AMR

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**Question:**

Based on information provided in response to the above requests and in the Company's application in Case No. 06-1453-GA-UNC, please estimate the amount of the AMR Cost Recovery Charge after each of the first five years that costs are collected for such recovery. Utilize the schedule provided in response to Item 8 above, and assume that no costs will be funded through the over-accrued depreciation reserve.

---

**Answer:**

Based on the schedule provided in Item 9 and an estimate of the customer communication and appointment scheduling expenses that would be included in the program cost, the estimated AMR Cost Recovery Charges are as follows:

The preceding table reflects the impact of annual rate cases being filed in 2009 and beyond. As stated in the application requesting approval of the rider, the Company will include AMR investments in rate base in subsequent rate cases, which will reduce the amount to be recovered via the AMR Cost Recovery Charge. In addition, there are no meter reading savings reflected in the figures, which would serve to further reduce the rate.

---

**Preparer Of Response:**

Jeff Murphy

---

**Date Prepared:**

11/01/2007 03:17:13 PM EDT

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**Attachments:**

No



**The East Ohio Gas Company d/b/a Dominion East Ohio**  
**Case No. 07-0829-GA-AIR**  
**Response to Data Requests**

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**Requesting Party:**

PUCO

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**Data Request Set:**

Peter Baker

---

**Question Number:**

02

---

**Subpart:**

12

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**Request Date:**

10/17/2007

---

**Due Date:**

11/02/2007

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**Topic:**

AMR

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**Question:**

Using 2006 meter-reading O&M expense as a baseline and assuming the schedule provided in response to Item 7 above, please estimate the Company's annual meter-reading O&M savings.

---

**Answer:**

The Company does not expect to realize material savings until a sufficient quantity of complete routes are automated for mobile reading. The Company has calculated the following savings based on potential meter reading headcount reductions in the future. It should be noted that the Company expects many of those positions to be redeployed to other areas of the Company.

2009 - \$ 900,000

2010 - \$ 1,300,000

2011 - \$ 2,950,000

2012 - \$ 6,000,000

---

**Preparer Of Response:**

William Armstrong

---

**Date Prepared:**

11/01/2007 03:14:09 PM EDT

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**Attachments:**

No

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**The East Ohio Gas Company d/b/a Dominion East Ohio**  
**Case No. 07-0829-GA-AIR**  
**Response to Data Requests**

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**Requesting Party:**

PUCO

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**Data Request Set:**

Peter Baker

---

**Question Number:**

6

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**Subpart:**

11

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**Request Date:**

12/07/2007

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**Due Date:**

12/21/2007

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**Topic:**

AMR

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**Question:**

Unless otherwise noted, the following items relate to DEO's response to Staff  
Data Request # 4.

11. With respect to Subpart 12, please develop a similar analysis of the annual  
customer communication costs (relating to its MGSS-required meter access plan)  
that DEO would avoid after completion of its 5-year AMR installation program.

---

**Answer:**

Please see the attached cost analysis.

---

**Preparer Of Response:**

Carrie Fanelly

---

**Date Prepared:**

12/21/2007 10:07:22 AM EST

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**Attachments:**

Yes

---

**Attachment Names:**

PUCO DR #6.11 Cust Communications Cost Savings- AMR.doc

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## **Cost Saving of the AMR Deployment Plan for Call Center Operations**

### **Assumptions**

1. The largest cost saving comes from installing ERT indexes on inside meters.
2. Based on several years of statistical data, customers with inside meters call us 1.036 times per year on average, while customers with outside meters call us .65 times per year on average for billing and meter service related inquiries.
3. When ERT devices are installed on the inside meters, inside-meter call patterns will more closely resemble outside-meter call patterns. (Many calls from customers with inside meters relate to bills that resulted from estimated reads. Estimated reads generally result from lack of access to the meter. Because DEO will be able to obtain "actual" reads on ERT meters, as well as outside meters, the cause of many calls from inside-meter customers will be eliminated.) One behavior pattern that will not change is the call volume patterns related to required DOT inspection.
4. Dominion East Ohio has 1,290,000 meters; 43% are located inside, and 57% are located outside.
5. In addition to the behavioral changes of the customers with inside meters, billing calls related to high bill complaints will decrease as well as handle times around those bills. This reduction will decrease the call volume for the billing related calls by 10% based on sample call data.
6. Dominion will reduce the number of letters sent to customers with inside meters requesting access to read their meters.
7. Dollars saved are at the end of full deployment and in today's dollars.

### **Call Volume Impacts/ Customer Communications**

1. **Inside Meters Call Reduction:** This equates to 556,000 customers (with inside meters), calling at an average of 1.036 times per customer per year, or 576,033 calls. Change in behavior results in 556,000 customers calling .65 times per year. This represents an overall yearly reduction of 216,633 calls. Installation of ERT devices will not preclude the need to gain access to carry out DOT inspections, however; thus, DOT inspections will still require an estimated 91,173 customer calls per year. This results in a net reduction in calls for inside meters of 123,460.
2. **Bi-monthly Reads to Monthly Call Reduction:** Last year, Dominion handled 418,459 billing calls in Ohio from customers with outside meters. Assuming a call volume equivalent (handle times and reduced volume) reduction of 10%, we expect to experience an additional reduction of 41,846 calls.
3. **Total Call Volume Reduction:** 165,306 calls
4. **Total Letter Communication Volume Reduction:** 81,986 letters

### **Cost Savings Results from Reductions Above**

1. Cost Savings associated with call volume reduction is 10 FTEs for a total savings of \$657,945 including benefits.
2. Phone bill savings would amount to \$99,183.
3. Letter savings \$30,334.
4. **Total AMR annual savings \$784,472 after full deployment with monthly meter reading schedule**

**Trevor R. Roycroft, Ph.D.**

**CONFIDENTIAL**  
**Attachment TRR-8**

**Omitted in Public Version**

**The East Ohio Gas Company d/b/a Dominion East Ohio**  
**Case No. 07-0829-GA-AIR**  
**Response to Data Requests**

---

**Requesting Party:**

PUCO

---

**Data Request Set:**

Peter Baker

---

**Question Number:**

02

---

**Subpart:**

4

---

**Request Date:**

10/17/2007

---

**Due Date:**

11/02/2007

---

**Topic:**

AMR

---

**Question:**

Please provide the number of AMRs the Company had already installed and added to plant in service as of the date certain in this case.

---

**Answer:**

The Company installed 18,056 devices as of March 31, 2007, the date certain in this case.

---

**Preparer Of Response:**

William Armstrong

---

**Date Prepared:**

11/01/2007 02:49:03 PM EDT

---

**Attachments:**

No

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**The East Ohio Gas Company d/b/a Dominion East Ohio**  
**Case No. 07-0829-GA-AIR**  
**Response to Data Requests**

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**Requesting Party:**

OCC

---

**Data Request Set:**

Interrogatories - 14th Set

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**Question Number:**

517

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**Subpart:**

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**Request Date:**

05/16/2008

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**Due Date:**

06/05/2008

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**Topic:**

AMR

---

**Question:**

Referring to the Company's Response to OCC Request for Production of Document No. 160, the Company provided the PowerPoint file "CONFIDENTIAL DOCUMENT - Gas AMR Business Case Presentation March 21.ppt". On page 9 of that document, a table titled "Financial Summary" appears, and shows results of "Unlevered IRR; Unlevered NPV (9.4%%; 15yrs); and Payback (Yrs)" analyses.

- a. Please explain why the Company pursued an unlevered approach to these calculations;
- b. Has the Company calculated for the AMR project Levered IRR and Levered NPV? If yes, please report the values produced by these studies in a format similar to that shown on page 9 of this document;
- c. Please identify the values of each discount factor used in the Unlevered IRR analysis (and any Levered IRR study), and the Unlevered NPV analysis (and any Levered NPV study), and identify which discount factor was used in each study.

---

**Answer:**

- a. The Company calculates both levered and unlevered results; however, since there are different business units within Dominion, each with different capital structures and risk profiles, the unlevered information is used to compare capital investments across Dominion's business units.
- b. Please see the attached file, which has been updated to include the requested levered results on Slide 19.
- c. The financial results reflected in the attached file used a discount rate of 9.4%.

---

**Preparer Of Response:**

Abby Corbin

---

**Date Prepared:**

05/16/2008 02:52:24 PM EDT

---

**Attachments:**

Yes

**Attachment Names:**

CONFIDENTIAL DOCUMENT - Gas AMR Business Case Presentation March 21-REVISED.ppt

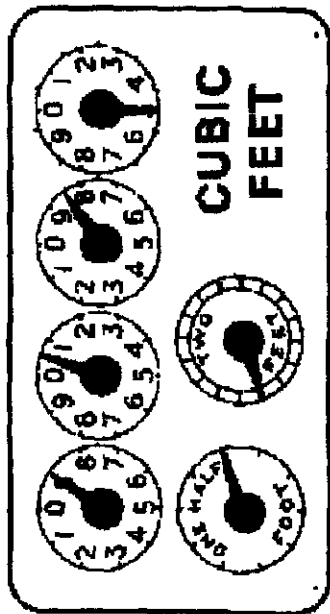
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**Dominion**

It all starts here.





# **AMR Business Case Team**

---

**Bill Armstrong**

**Joe Patten**

**Patty Gilinsky**

**Bob Metzinger**

**David Batson**

**Rod Holmes**

**Abby Corbin**

**Ken Opiery**

**Ad Hoc: Brett Crable**

**Gwen Beadles**

**Ella Hochstetler**

# **Business Case - What Has Changed?**

---

- **Added Fixed Network technology solution scenario**
- **Ran three “best” scenarios**
- **WACC went from 8% to 9.4%**
- **Cost to comply with inside meter reading criteria of OMGSS went from \$8.6M to \$9.6M - \$9.9M.**
- **Call Center costs added to each scenario - + \$400K/year**

# **Ohio Gas Meter Statistics**

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- **1.3M total Gas meters**
- **560K inside meters (43.1%)**
- **370K inside meters with existing Hexagram, Badger or Read-O-Matic devices**
- **190K inside meters with no remote reading devices**

**Looking ahead, the Ohio Minimum Service Standards will impose a significant cost increase to Metering and Customer Service**

Ohio Standard	Current Practice & Concerns	Estimated Costs	Impact of Gas AMR
<ul style="list-style-type: none"> <li>Obtain <i>actual</i> reading at least once every <i>12 months</i> and make <i>reasonable attempts</i> to obtain reads every <i>other month</i>. Electronic (AMR)= actual; remote meter index reads are not considered actual.</li> </ul>	<ul style="list-style-type: none"> <li>DEO attempts to read meters every other month. The company gets in approximately 20% of inside accounts with remote devices annually.</li> <li>DEO has 370,000 inside remote units</li> </ul>	<ul style="list-style-type: none"> <li>\$9-10M based on 270 – 378k additional service orders</li> </ul>	<ul style="list-style-type: none"> <li>AMR would be fully compliant with new rule and avoid associated costs of \$9-10M annually</li> </ul>

Three scenarios were analyzed to determine if a full or partial deployment would decrease high read costs, and mitigate the impact of the Ohio Minimum Gas Service Standards.

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- Full Deployment Scenario
  - Full deployment, 1.3M meters retrofitted with Itron ERT index; read monthly with mobile collection; deployed over three years
- Inside Meters Scenario
  - Partial deployment, All 560K inside meter locations retrofitted with Itron ERT indexes; plus 111K outside meters in close proximity to areas of high inside concentration; ERTed meters read monthly; mobile collection. Manual meters read bi-monthly; deployed over three years
- Inside Meters Fixed Network Scenario
  - Partial deployment, All 560K inside meter locations retrofitted with Hexagram Star Network MTU devices; plus 111K outside meters in close proximity to areas of high inside concentration. Meters read monthly or on demand; Fixed network area coverage; Manual meters read bi-monthly; deployed over three years

# DOT Inspection Program

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- All scenarios include creation of 26 employee DOT inspection group
  - Approximately 560K inside meter locations require inspection every 3 years
  - Initial installations would provide 100% compliance
  - Call Center net cost \$400K
  - Move existing Inspector and Dispatcher classification to DOT roles to mitigate RIF

**Annual Costs after Full AMR Deployment**

**\$3.2M**

# Assumptions

## Assumptions

9.4% WACC  
3.0% Average annual salary increases  
AMR meters read monthly, manual meters read bi-monthly  
Meters depreciated over 44 years  
ERTs depreciated over 15 years  
88K tin meters will be exchanged with TC meters  
Meter Change Labor - \$100  
MTU install cost - \$101  
ERT price \$45  
Index Price \$3  
Inside retrofit \$16.5  
Outside retrofit \$13.5  
AMR reads per route - 5,000  
X-letter orders eliminated  
Meter maintenance / Read meter order reduction 80 - 50%  
Turn on/off order reduction 25 - 10%  
Hexagram replacement costs eliminated  
Annual benefits include \$9.6M - \$9.9M avoided OH M S S  
Added Customer Service employees - 1-4  
ERT Failure Rate .3 - .5%  
DOT orders per day - 35  
No access / returned to DEOG 5%

## Annual Benefits include:

Labor, Vehicles, OH Standards avoidance.

# FTE Summary

Scenario	Full Deployment	Inside Meters	Inside Meters Network
Meter Reader	(83)	(46)	(55)
Supervisor (MR)	(3)	(2)	(2)
Customer Service			
Read Orders	(17)	(12)	(19)
ERT Orders	4	2	2
DOT Compliance	26	26	26
Net FTEs	(73)	(32)	(48)
Net Labor & Vehicles			
Annual - after implementation	\$ (3,731,176)	\$ (1,057,780)	\$ (2,231,592)

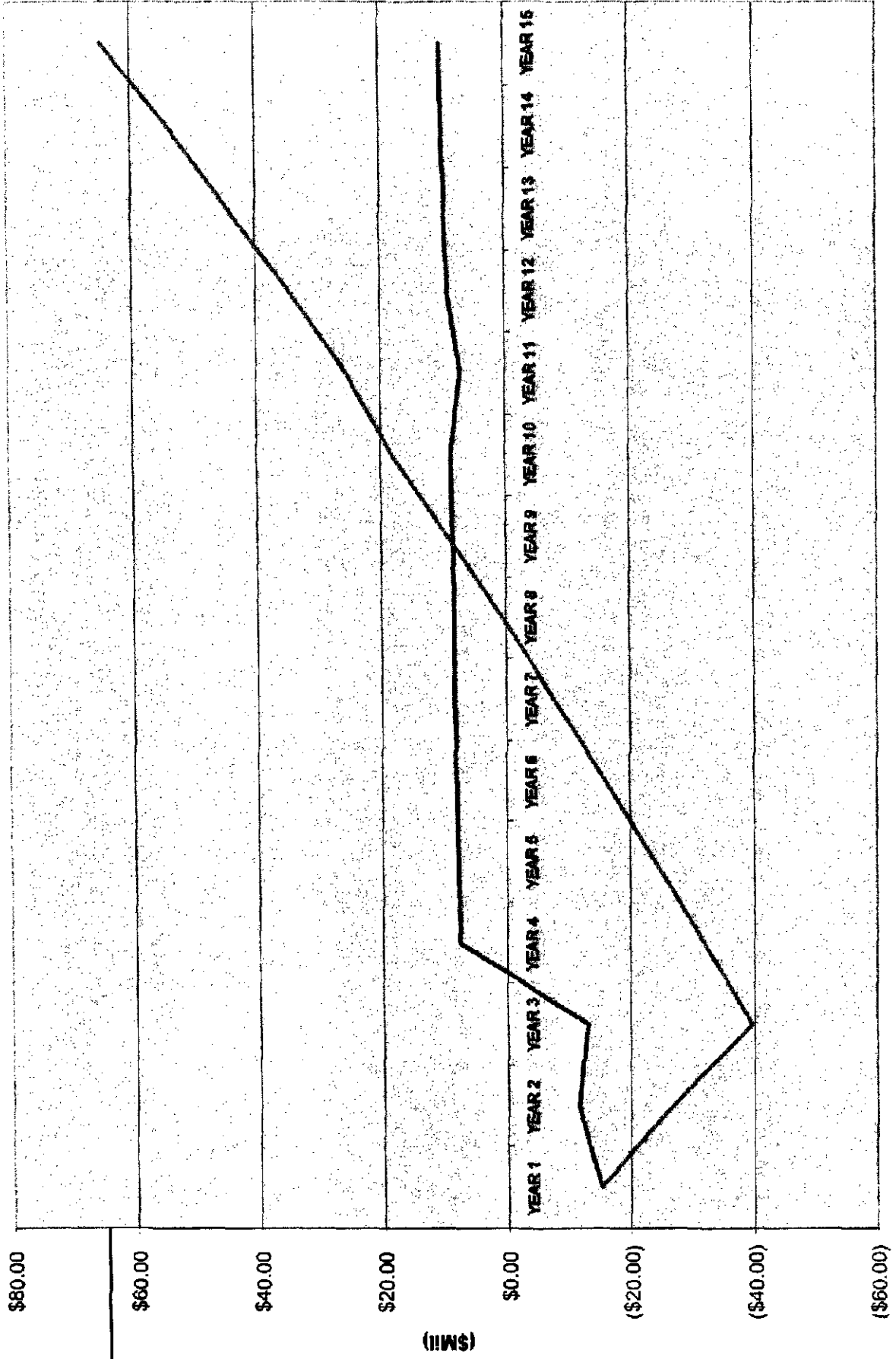


# Financial Summary

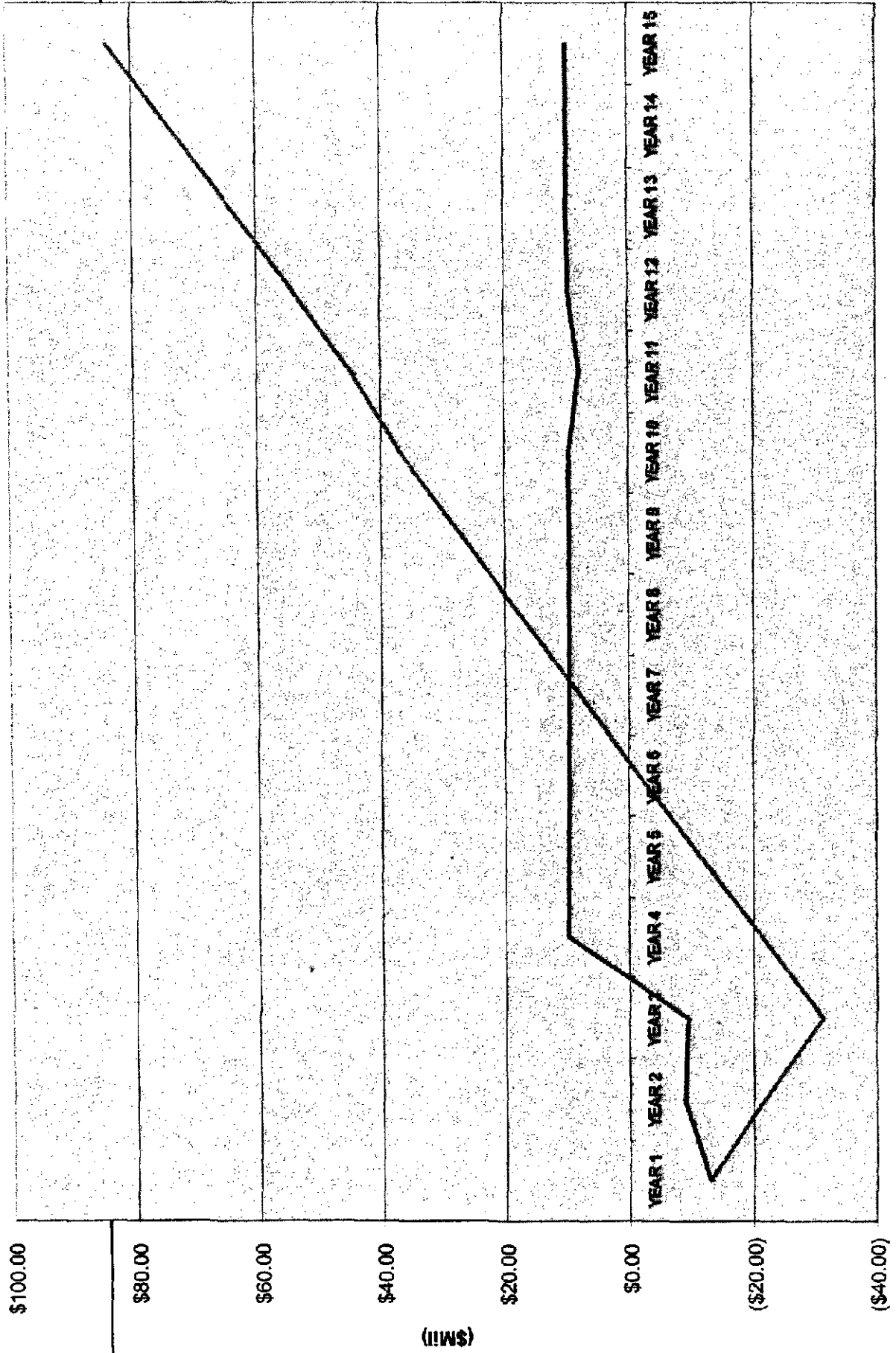
		Steady State					
	Description	Deployment Cost	1st Year Net Income	Net Income (Yrs 4-6)	Unlevered IRR	Unlevered NPV (9.4%; 15yrs)	Payback (Yrs)
Full Deployment							
A-3 Year Installation	Full deployment; 1.3M meters	\$94.8 M	\$3.8M	\$3.5M	12.32%	10,980,926	7
Full Deployment							
3 Year Installation	Full deployment; 1.3M meters	\$102.8 M	\$3.6M	\$2.3M	9.18%	(868,013)	7.6
Inside Meters	Partial deployment, All 560K inside meter locations, plus 111K outside meters						
A-3 Year Installation		\$59.5 M	\$4.5M	\$4.1M	22.27%	22,690,245	2.4
Inside Meters	Partial deployment, All 560K inside meter locations, plus 111K outside meters						
3 Year Installation		\$65.4 M	\$4.4M	\$3.2M	17.40%	18,436,996	4.7
Inside Meters Network	Partial deployment, All 560K inside meter locations, plus 111K outside meters						
3 Year Installation		\$85.1 M	\$3.8M	\$2.2M	11.08%	5,524,764	5.9

1. NPV and IRR rates unlevered
2. Steady-State EBIT approximates year 4-6 benefits

# Partial Deployment Mobile

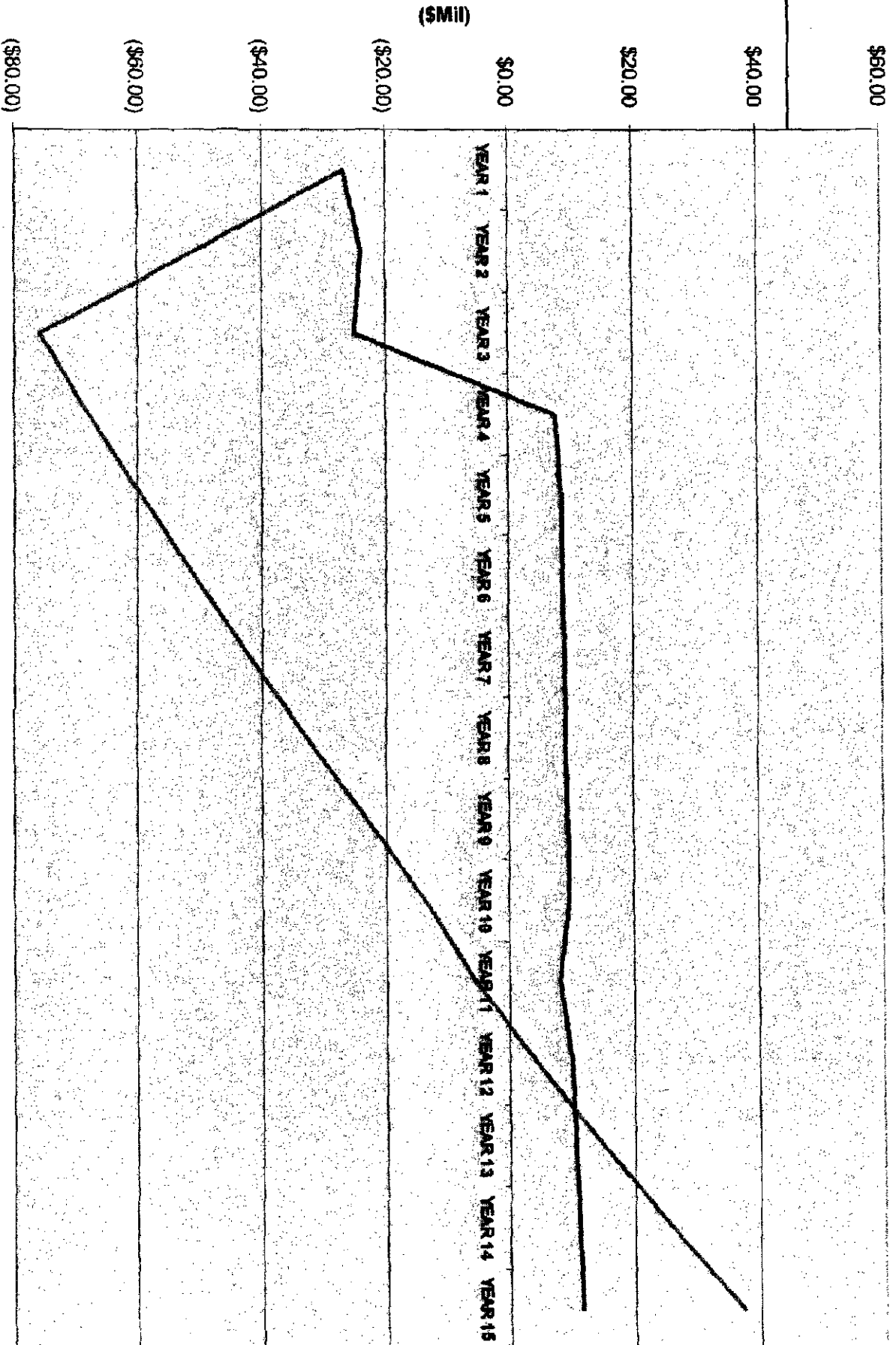


# Partial Deployment Mobile Aggressive

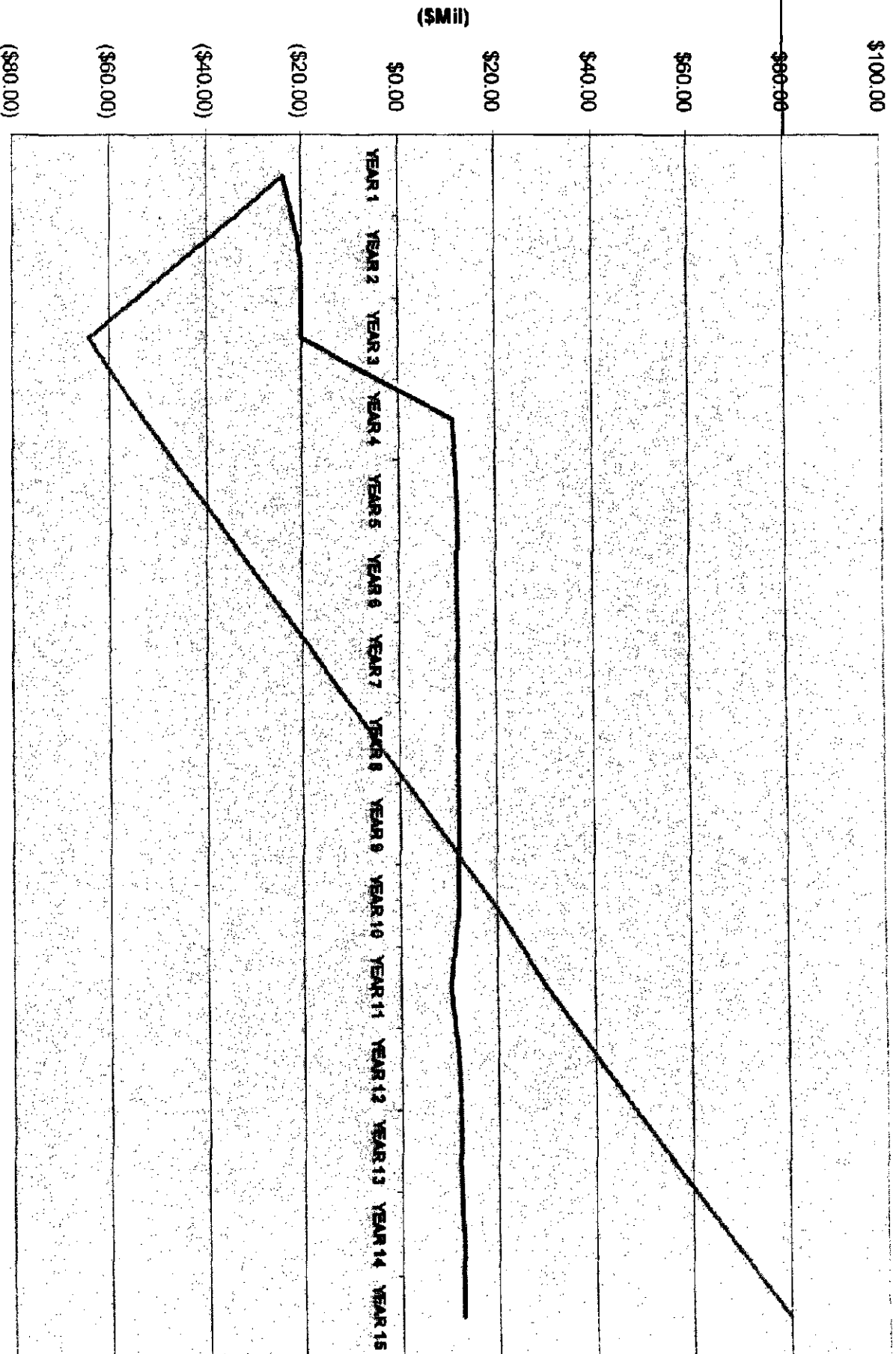


— Annual Net Cash Flow      - - - Cumulative Net Cash Flow

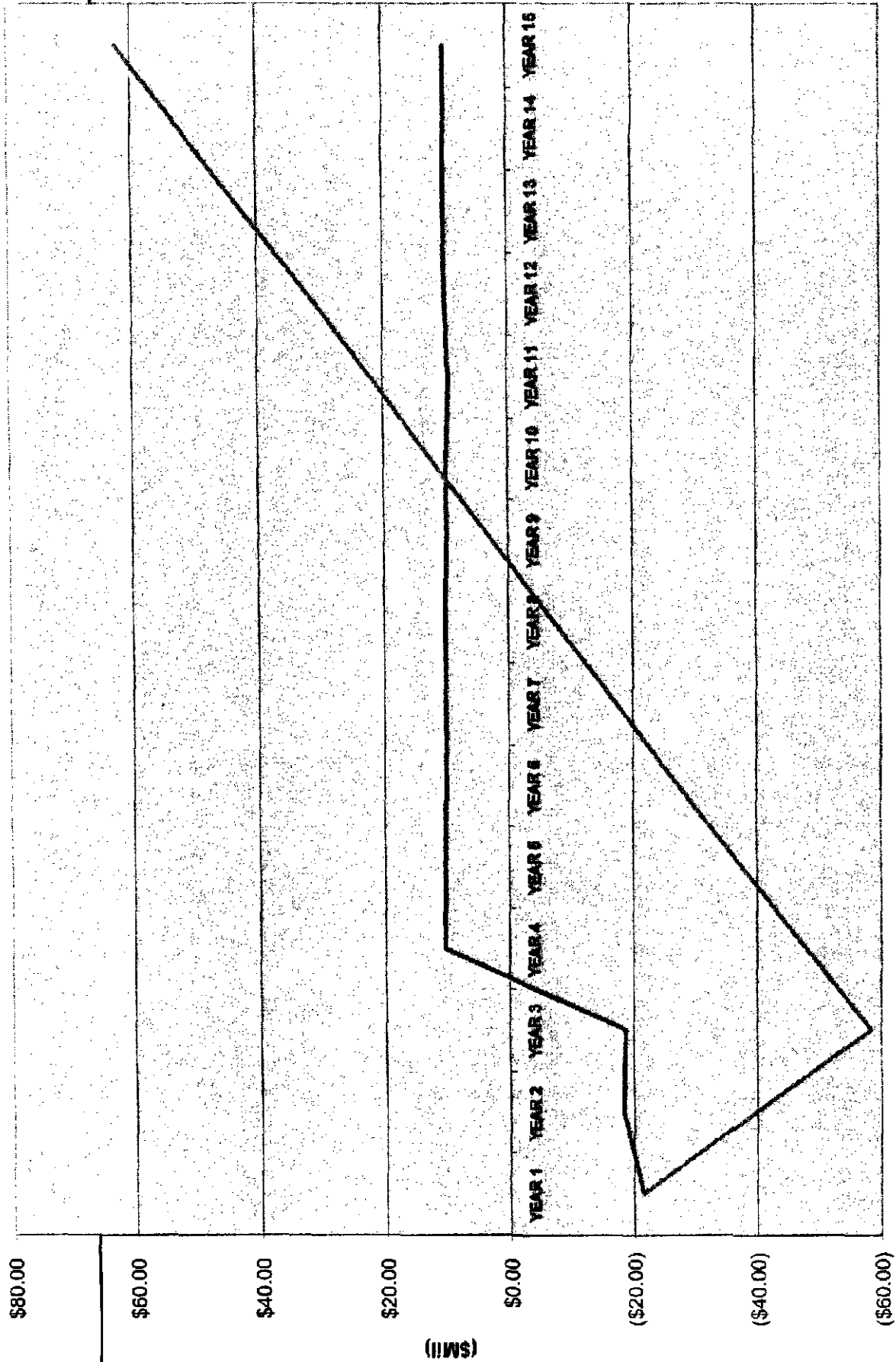
# Full Deployment Mobile



# Full Deployment Aggressive



# Partial Deployment Fixed Network



— Annual Net Cash Flow

- - - Cumulative Net Cash Flow

# Assumptions

## Assumptions - Conservative

9.4% WACC  
 3.0% Average annual salary increases  
 AMR meters read monthly, manual meters read bi-monthly  
 Meters depreciated over 44 years  
 ERTs depreciated over 15 years  
 88K tin meters will be exchanged with TC meters  
 Meter Change Labor - \$100  
 MTU install cost - \$101  
 ERT price \$45  
 Index Price \$3  
 Inside retrofit \$16.5  
 Outside retrofit \$13.5  
 AMR reads per route - 5,000  
 X-letter orders eliminated  
 Meter maintenance / Read meter order reduction 80 - 50%  
 Turn on/off order reduction 25 - 10%  
 Hexagram replacement costs eliminated  
 Annual benefits include \$9.6M - \$9.9M avoided OH M S S  
 Added Customer Service employees - 1-4  
 ERT Failure Rate .3 - .5%  
 DOT orders per day - 35  
 No access / returned to DEOG 5%

## Assumptions - Aggressive

9.4% WACC  
 3.0% Average annual salary increases  
 AMR meters read monthly, manual meters read bi-monthly  
 Meters depreciated over 44 years  
 ERTs depreciated over 15 years  
 88K tin meters will be exchanged with TC meters  
 Meter Change Labor - \$80  
 MTU install cost - \$101  
 ERT price \$42.75  
 Index Price \$1.25  
 Inside retrofit \$16.5  
 Outside retrofit \$13.5  
 AMR reads per route - 10,000  
 X-letter orders eliminated  
 Meter maintenance / Read meter order reduction 80 - 50%  
 Turn on/off order reduction 25 - 10%  
 Hexagram replacement costs eliminated  
 Annual benefits include \$9.6M - \$9.9M avoided OH M S S  
 Added Customer Service employees - 0  
 ERT Failure Rate .2%  
 DOT orders per day - 41  
 No access / returned to DEOG 2%

## Annual Benefits include:

Labor, Vehicles, OH Standards avoidance,

# Cost Assumptions Range

## Inside Meters Scenario

### 3 Year Installation

	Conservative	Aggressive
NPV	\$18.4M	\$22.6M
IRR	17.4%	22.27%
Deployment Costs	\$65.4M	\$59.5M



# Cost Assumptions Range

## Full Deployment Scenario

### 3 Year Installation

	Conservative	Aggressive
NPV	\$-0.9 M	\$10.9M
IRR	9.18%	12.32%
Deployment Costs	\$102.8M	\$94.8M

# Call Center Impact

<u>Costs:</u>						
	Year 1	Year 2	Year 3	Year 4	Year 5	Steady State
1. DOT Inspection Program (94k calls per year)- assumes 50% success rate	\$ -	\$ -	\$ (542,850)	\$ (542,850)	\$ (542,850)	\$ (542,850)
2. Reroute Letters Bank Draft Customers and customers moving 3+ cycles	\$ (107,930)	\$ (107,930)	\$ (107,930)			
3. Implementation- Missed Appointments or other miscellaneous questions	\$ (71,954)	\$ (71,954)	\$ (71,954)			
4. Targeting customers less willing to comply- 1% of inside meters		\$ (14,373)	\$ (14,373)	\$ (14,373)		
5. Credit Payment and Reconnect - assumed credit # on info to customer						
<b>Total Costs</b>	<b>\$ (179,884)</b>	<b>\$ (194,257)</b>	<b>\$ (737,107)</b>	<b>\$ (557,223)</b>	<b>\$ (542,850)</b>	<b>\$ (542,850)</b>
<u>Benefits:</u>						
1. Reads called in (IVR, By Phone)		\$ 6,512	\$ 13,024	\$ 19,536	\$ 19,536	\$ 19,536
2. SO Check Reads - Six Sigma project this year already take this reduction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3. Reduced number of estimated reads, calls from high bills created from X months of estimates	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4. Reduction in AHT in High Billing Complaints-(assume X% reduction)	\$ -	\$ 36,886	\$ 73,772	\$ 110,659	\$ 110,659	\$ 110,659
<b>Total Benefits</b>	<b>\$ -</b>	<b>\$ 43,398</b>	<b>\$ 86,796</b>	<b>\$ 130,195</b>	<b>\$ 130,195</b>	<b>\$ 130,195</b>
<b>Annual Total</b>	<b>\$ (179,884)</b>	<b>\$ (150,859)</b>	<b>\$ (650,311)</b>	<b>\$ (427,029)</b>	<b>\$ (412,655)</b>	<b>\$ (412,655)</b>
<b>Total Cost of Project to Call Center</b>	<b>\$ (5,947,292)</b>					
<b>NPV Impact to call center</b>	<b>\$ (3,291,361)</b>					

# Financial Summary with Levered Info

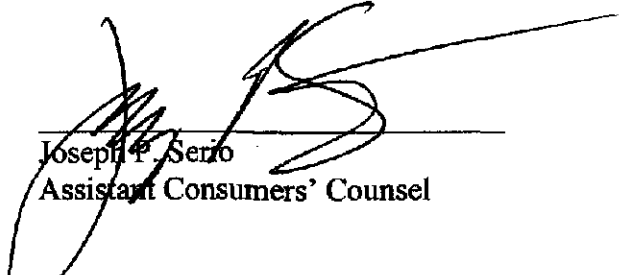
		Deployment	1st Year Net Income	Steady State Net Income (Yrs 4-6)	Levered IRR	Levered NPV	Payback (Yrs)
Description		Cost					
Full Deployment A-3 Year Installation	Full deployment; 1.3M meters	\$94.8 M	\$3.8M	\$3.5M	19.99%	19,695,325	7
Full Deployment 3 Year Installation	Full deployment; 1.3M meters	\$102.8 M	\$3.6M	\$2.3M	14.12%	9,004,105	7.6
Inside Meters A-3 Year Installation	Partial deployment, All 560K inside meter locations, plus 111K outside meters	\$59.5 M	\$4.5M	\$4.1M	47.06%	31,986,764	2.4
Inside Meters 3 Year Installation	Partial deployment, All 560K inside meter locations, plus 111K outside meters	\$65.4 M	\$4.4M	\$3.2M	33.74%	23,782,095	4.7
Inside Meters Network 3 Year Installation	Partial deployment, All 560K inside meter locations, plus 111K outside meters	\$85.1 M	\$3.8M	\$2.2M	17.93%	13,301,389	5.9

1. NPV and IRR rates unlevered

2. Steady-State EBIT approximates year 4-6 benefits

## **CERTIFICATE OF SERVICE**

It is hereby certified that a true copy of the foregoing the *Direct Testimony and Public Attachment of Trevor R. Roycroft, Ph.D. on Behalf of the Office of the Ohio Consumers' Counsel* has been served via First Class US Mail (electronically upon DEO & DEO Counsel), this 23<sup>rd</sup> day of June, 2008.



\_\_\_\_\_  
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