

BOARD STAFF RESPONSE TO
ENBRIDGE GAS DISTRIBUTION INC. #11

INTERROGATORY

ISSUE A1: Is Enbridge's proposal for a Customized IR plan for a 5 year term covering its 2014 through 2018 fiscal years appropriate?

Evidence Ref: ExhL/T1/S2

I.A1.Staff.EGDI.11

Preamble:

On page 5, PEG states that an EGD IR plan for the 2014-2018 period "can also contain Y factors that recover the costs of large capital projects."

Request:

- a. Please provide copies of testimony where PEG has supported the use of Y Factors for capital projects.
- b. Please provide a list of all EGD capital projects that would qualify for "Y factors that recover the cost of large capital projects" in PEG's view.

RESPONSE

- a. Please see the response to I.A.1.Staff.EGD.10d) for PEG's support for capital trackers/"Y factors" in the District of Columbia, Delaware, Maryland and New Jersey; and the response to I.A.1.Staff.EGD.12 for PEG's support for capital trackers in Alberta. PEG has also provided testimony in support of a targeted capital replacement tracker for Bay State Gas in Massachusetts; a copy of this testimony is attached.
- b. While PEG has not undertaken an exhaustive review of all EGD capital projects, we believe the GTA and Ottawa reinforcement projects would qualify for Y factors.

Witness: Dr. Lawrence Kaufmann, PEG

Date: _____

Hearing Officer: _____

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

D.P.U. 07-89

**DIRECT TESTIMONY OF
LAWRENCE R. KAUFMANN, Ph.D.**

EXH. BSG/LRK-1

EXISTING PERFORMANCE-BASE REGULATION (“PBR”) PLAN

EXTRAORDINARY ECONOMIC CONDITIONS

MID-TERM ADJUSTMENTS UNDER PBR PLANS

**IN SUPPORT OF
BAY STATE GAS COMPANY’S
PETITION FOR A CHANGE IN TARIFFS
UNDER A PBR PLAN**

OCTOBER 17, 2007

**DIRECT TESTIMONY OF
LAWRENCE R. KAUFMANN, Ph.D.**

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1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Lawrence R. Kaufmann. My business address is 22 East Mifflin, Suite
4 302, Madison, WI, 53703.

5 **Q. WHAT IS YOUR POSITION AND WHAT ARE YOUR RESPONSIBILITIES?**

6 A. I am a Partner at Pacific Economics Group LLC (“PEG”). My work includes
7 designing and providing empirical support on performance-based regulation (“PBR”)
8 plans for energy utility clients. My specific duties include designing regulatory plans
9 that create strong performance incentives, supervising research on the productivity
10 and input price trends of utility industries, benchmarking utility cost performance,
11 and expert witness testimony. I have been involved in PBR-related projects for a
12 large number of gas and electric utility clients.

13 **Q. WHAT IS YOUR PROFESSIONAL AND EDUCATIONAL BACKGROUND?**

14 A. Prior to co-founding the Madison office of PEG in 1998, I was employed from 1993
15 until 1998 as a Senior Economist at Christensen Associates, an economic consulting
16 firm based in Madison. I received a PhD in Economics from the University of
17 Wisconsin in 1993.

18 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE DEPARTMENT OF**
19 **PUBLIC UTILITIES?**

20 A. Yes. I filed both direct and rebuttal testimony on the PBR plan proposed by Bay
21 State Gas (“Bay State” or the “Company”) in D.T.E. 05-27 and by Boston Gas
22 Company in D.T.E. 03-40. I also filed direct and rebuttal testimony on Bay State’s
23 proposed exogenous cost filing in D.T.E. 06-77. I am currently testifying on behalf
24 of a group of Massachusetts utilities in D.P.U. 07-50, the Department’s examination
25 of revenue decoupling and the efficient deployment of demand resources. I also co-

1 authored a report that was attached to testimony on service quality PBR in
2 Massachusetts (D.T.E. 99-84) and testified before the Department in that proceeding.

3 **Q. HAVE YOU TESTIFIED BEFORE OTHER COMMISSIONS?**

4 A. Yes. I have filed testimony on PBR issues in Michigan, Rhode Island, Kansas,
5 Hawaii, Oklahoma, and Kentucky. I have co-authored reports that were attached to
6 PBR testimony in California and British Columbia. I have also testified overseas in
7 Australia and New Zealand on PBR issues.

8 **Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?**

9 A. This testimony will address Bay State Gas Company's proposal to adjust its base
10 rates under the "extraordinary economic conditions" provision approved in D.T.E.
11 05-27. The Company proposes to update base rates to reflect the decline in average
12 gas use per customer ("AUPC") and to recover the costs of capital replacement
13 spending for Bay State's steel infrastructure replacement ("SIR") program that has
14 occurred since the test year that was used to set "cast off" rates in D.T.E. 05-27.

15 **Q. CAN YOU SUMMARIZE YOUR CONCLUSIONS?**

16 A. Yes. I believe the Company's filing is consistent with the multi-year PBR plan that
17 was approved in D.T.E. 05-27. Bay State's approved PBR plan allows utilities "to
18 petition the Department for changes in tariffed rates in reaction to extraordinary
19 economic conditions" (D.T.E. 05-27 at 400). The Company is requesting a one-time
20 rate adjustment because, in the absence of such an adjustment, it will have persistent
21 difficulty in earning its allowed ROE over the remaining years of its PBR plan. I
22 believe the "extraordinary economic conditions" provision is precisely designed to
23 allow for one-time rate adjustments in response to uncontrollable events like those
24 that Bay State has experienced and which, if not otherwise rectified, would ultimately
25 impact both customers and shareholders adversely.

26 The Company's filing is primarily motivated by the revenue declines it has
27 experienced since 2005 because of declining natural gas consumption. While AUPC

1 has been declining in the natural gas industry for nearly three decades, this trend has
2 accelerated in recent years because of the rapid increase in natural gas prices. Bay
3 State's "cast off" rates are based on 2004 test year billing determinants, and declines
4 in AUPC since 2004 have been more pronounced for gas distributors in the Northeast
5 US. The Company could do almost nothing to control or manage the revenue impact
6 of declining AUPC. Moreover, the effects of this decline were not reflected in the
7 design of Bay State's approved PBR plan or in the "cast off" rates to which PBR rate
8 adjustments are applied. The rates approved in D.T.E. 05-27 are accordingly not
9 providing Bay State a reasonable opportunity to earn its allowed ROE because the
10 conditions impacting the Company's revenues are very different from the historical
11 conditions that were used to set rates in D.T.E. 05-27.

12 Bay State's request is also consistent in spirit with other, mid-term adjustments the
13 Department has approved for companies operating under long-term PBR plans. For
14 example, in D.T.E. 05-66, Boston Gas requested that it be allowed to recover its
15 increased bad debt expense through the exogenous factor provisions in its PBR plan.
16 Boston Gas argued that this adjustment was warranted given the additional expense
17 resulted from the exogenous impact of higher natural gas prices, and the Department
18 approved the company's request. Bay State's proposed correction also stems in large
19 part from the same underlying cause (higher natural gas prices) as that which led to
20 Boston Gas's approved adjustment. Although the same exogenous event has
21 impacted Bay State's revenues more significantly than its (bad debt) costs, the
22 companies' filings are clearly similar in that both use provisions in approved PBR
23 plans to petition for rate adjustments during the term of those plans. Both filings are
24 also designed in part to offset the adverse financial impact on natural gas distributors
25 resulting from higher gas commodity prices.

26 **Q. HOW IS THE TESTIMONY ORGANIZED?**

27 A. Following this introduction, the testimony is organized in four sections. Section II
28 briefly discusses the PBR plan that was approved for Bay State in D.T.E. 05-27.

1 Section III discusses the extraordinary conditions that have given rise to this filing,
2 particularly the accelerating decline of AUPC in the Northeast natural gas industry.
3 Section IV assesses Department precedents regarding mechanisms in PBR plans
4 designed to ameliorate the adverse financial impact on companies because of
5 exogenous and extraordinary economic events. Section V presents concluding
6 remarks

7 **II. EXISTING PBR PLAN FOR BAY STATE**

8 **Q. PLEASE DESCRIBE THE PBR PLAN APPROVED FOR BAY STATE IN**
9 **D.T.E. 05-27.**

10 A. The PBR plan approved for Bay State in December 2005 was very similar to that
11 approved for Boston Gas in D.T.E. 03-40. Both plans indexed prices, not revenues,
12 and had 10 year terms. The price cap index ("PCI") formula for both companies used
13 the GDP-PI as the inflation factor. The X factor for Bay State Gas was 0.51 per cent,
14 while the approved X factor for Boston Gas was 0.41 per cent. The only difference
15 between these approved X factors was that a 0.3 per cent consumer dividend was
16 implemented for Boston Gas, while the consumer dividend for Bay State was 0.4 per
17 cent. Both plans also have essentially identical provisions for allowed pricing
18 flexibility, service quality incentives, earnings sharing, exogenous costs and tariff
19 adjustments in response to extraordinary economic conditions.

20 **Q. EXCLUDING THE CONSUMER DIVIDEND, THE X FACTOR FOR BOTH**
21 **BAY STATE AND BOSTON GAS WAS 0.11 PER CENT. WHAT WAS THE**
22 **BASIS FOR THIS APPROVED, COMMON VALUE?**

23 A. The X factor net of the consumer dividend is equal to the sum of the productivity
24 differential (*i.e.* the long-run total factor productivity ("TFP") trend of the gas
25 distribution industry minus the long-run TFP trend of the US economy) and the
26 inflation differential (*i.e.* the input price trend for the U.S. economy minus the input
27 price trend for the gas distribution industry). In D.T.E. 03-40, the 0.11 per cent value

1 approved for the sum of the productivity and inflation differentials was based on
2 research I presented in that proceeding on TFP and input price trends for the
3 Northeast gas distribution industry and the U.S. economy. The Department approved
4 the values I estimated for these parameters, using data for the 1990 through 2001
5 period. Because the Bay State PBR plan was proposed less than eighteen months
6 after the Boston Gas plan was approved, I did not update the TFP or input price
7 studies when proposing an appropriate X factor for Bay State's plan but rather
8 proposed that the same X factor (net of the consumer dividend) approved in D.T.E.
9 03-40 also be implemented for Bay State. The Department agreed with this
10 recommendation, so the same study was used to establish an X factor (net of the
11 consumer dividend) for both Boston Gas and Bay State.

12 **Q. THE SAMPLE PERIOD FOR THESE TFP AND INPUT PRICE STUDIES**
13 **WAS 1990 TO 2001. DOES THIS SAMPLE PERIOD HAVE IMPLICATIONS**
14 **FOR BAY STATE'S CURRENT FILING?**

15 A. Yes. The sample period used to set the terms of Bay State's PBR plan ends in 2001.
16 Obviously, this sample period does not reflect the experience of the natural gas
17 industry from 2002 to the present. This is relevant because, since 2002, gas
18 commodity prices have generally trended sharply upward. These price increases
19 would tend to depress natural gas consumption and revenues. All else equal,
20 declining consumption would also be reflected in less productivity growth and a
21 lower X factor. These trends since 2002 are necessarily not reflected in the PBR plan
22 approved for Bay State Gas.

23 **Q. IF DECLINES IN NATURAL GAS CONSUMPTION REDUCE GAS**
24 **DISTRIBUTOR REVENUES, WILL THEY NEGATIVELY IMPACT GAS**
25 **DISTRIBUTOR EARNINGS AS WELL?**

26 A. Yes. The reason is that gas distribution is essentially a fixed cost business. Nearly all
27 gas distribution costs (*e.g.* the costs of gas distribution mains, services and meters) are
28 fixed. These inputs are designed to deliver gas from gas pipelines to end-users, but

1 once this infrastructure is in place the incremental costs of delivering a given volume
2 of natural gas are close to zero. The Department's current rate design principles
3 assure that a significant portion of a utility's fixed costs, including the allowed
4 earnings levels, are recovered through volumetric rates. Thus, a decline in AUPC
5 causes a decline in revenues, and any decline in gas distribution revenues therefore
6 translates dollar for dollar into a nearly equivalent decline in earnings.

7 **Q. BAY STATE'S PBR PLAN IS INDEXED AGAINST PRICES AND NOT**
8 **REVENUES, OR REVENUES PER CUSTOMER. IS THIS FACT**
9 **RELEVANT TO BAY STATE'S CURRENT FILING?**

10 A. Yes. Assuming there are no exogenous cost or extraordinary economic condition
11 filings, a price indexing PBR plan will adjust allowed tariffs only for changes in
12 GDP-PI inflation minus the approved X factor, plus or minus any revenue
13 adjustments due to the operation of the earnings sharing and service quality incentive
14 mechanisms. Price indexing PBR plans do not allow tariffs to be adjusted because of
15 declines in AUPC. However, a revenue per customer indexing plan would allow for
16 tariff adjustments in response to declining AUPC, in addition to the other adjustments
17 that take place under a price indexing PBR plan. These two rate adjustment
18 mechanisms – one primarily designed to address changes in unit costs and the other
19 primarily designed to reflect changes in AUPC – are mutually supporting and focused
20 on complementary objectives.

21 Bay State has experienced a significant decline in its AUPC relative to the levels that
22 were used to set “cast off” rates in D.T.E. 05-27. The Company's current filing is
23 prompted by the revenue losses resulting from the decline in its AUPC. The PBR
24 plan approved in D.T.E. 05-27 was not designed to adjust Company tariffs in
25 response to declining AUPC. It follows that the Company's current PBR plan was
26 not designed to respond to the phenomena that are the basis for the Company's
27 current filing, a fact acknowledged by the Department's Straw Proposal introduced in
28 D.P.U. 07-50.

1 **Q. PLEASE DESCRIBE THE EARNINGS SHARING MECHANISM (“ESM”) IN**
2 **THE COMPANY’S PBR PLAN.**

3 A. Bay State’s ESM will share earnings that are outside of a “deadband” around the
4 allowed ROE between customers and shareholders. In the Company’s PBR plan, the
5 allowed ROE was set at 10% and the deadband at plus or minus 400 basis points. If
6 there are any “over-earnings” or “under-earnings” outside these bands, 75% of these
7 over- or under-earnings go to shareholders, while 25% are distributed to customers.

8 **Q. DOES BAY STATE’S ESM EFFECTIVELY PROTECT THE COMPANY**
9 **FROM EXTREME EARNINGS OUTCOMES?**

10 A. The ESM will provide some protection to both customers and shareholders from
11 transitory events that can lead to either exceptionally high or low earnings. However,
12 the ESM in Bay State’s plan is not designed to protect against events that lead to
13 earnings that are persistently and unreasonably high or persistently and unreasonably
14 low. The reason is that, compared to most ESMs that have been approved for energy
15 distributors, Bay State’s ESM has wide deadbands and assigns a large share of both
16 “under earnings” and “over earnings” to shareholders. This implies that customers
17 are at risk for unexpected events that would lead to persistently high and
18 unreasonable earnings. Conversely, if unexpected events tend to depress earnings for
19 an extended period of time, the Company bears a significant risk that it will not be
20 able to earn its allowed ROE. As explained further in Mr. Cote’s testimony,
21 persistent under-earning will eventually make it very difficult for Bay State to access
22 capital markets and finance the infrastructure investments needed to serve new and
23 existing customers.

24 **Q. PLEASE PROVIDE AN EXAMPLE OF HOW PERSISTENT UNDER-**
25 **EARNING IS POSSIBLE IN BAY STATE’S CURRENT PBR PLAN.**

26 A. Suppose there is a one-time, permanent reduction in the AUPC of Bay State
27 customers in the first year of the Company’s PBR plan. Further suppose that this
28 decline in AUPC leads to such a substantial loss in revenues that the Company’s

1 measured ROE falls to 0% for that year. In addition, assume the price changes
2 allowed under the current PBR mechanism are just sufficient to offset the expected
3 increase in the unit cost of providing gas distribution services in each year of the plan.
4 Under this scenario, the one-time, permanent decline in AUPC would cause reported
5 earnings to be 0% in each year of the PBR plan. The Company would obviously be
6 under-earning compared with its allowed ROE and would be allowed to recover some
7 of these under-earnings through the ESM. The ESM would lead to revenue
8 adjustments sufficient to recover 25% of earnings that fall below the 6% lower
9 earnings band. Thus, after the ESM adjustments take effect, the Company's ROE in
10 each of the remaining nine years of the PBR plan would be 1.5% (*i.e.* $.25 * 6\% =$
11 1.5%). It is very difficult, if not impossible, for utilities to access capital markets if
12 earnings levels are persistently this low.

13 **Q. PLEASE SUMMARIZE YOUR REVIEW OF BAY STATE'S CURRENT PBR**
14 **PLAN.**

15 A. Bay State's PBR plan was linked directly to the PBR plan that was approved for
16 Boston Gas in D.T.E. 03-40. This was a price indexing PBR plan with an X factor
17 (excluding consumer dividend) that was calibrated using data from the 1990 to 2001
18 period. The Company did not update the TFP and input price trends since there was
19 extensive review of the research I presented on these parameters in D.T.E. 03-40, and
20 the estimates were still quite recent at the time the Company's PBR plan was
21 proposed. The Department agreed that updated TFP and input price studies were not
22 necessary and approved the same X factor (net of the consumer dividend) for Bay
23 State as for Boston Gas.

24 Several aspects of Bay State's PBR plan are particularly relevant for the Company's
25 current filing. First, Bay State's PBR plan was not designed to compensate the
26 Company for declines in its AUPC. Second, the PBR plan was calibrated using data
27 from the 1990 to 2001 period and naturally could not reflect industry conditions after
28 2001, including further declines in AUPC or significant increases in capital

1 expenditures necessary to replace aging infrastructure only now reaching the end of
2 its useful life. Third, “cast off” rates for the PBR plan were set using 2004 billing
3 determinants, and any decline in AUPC since 2004 would negatively impact Bay
4 State’s revenues and earnings under the PBR plan. Finally, the ESM in Bay State’s
5 PBR plan was not designed to mitigate the impact of events that could lead to
6 persistent over-earning or under-earning relative to the Company’s allowed ROE. It
7 is possible, for example, for Bay State not to have a reasonable opportunity to earn its
8 allowed ROE under the currently structured PBR plan unless there are provisions for
9 updating rates to reflect the impact of extraordinary events.

10 **III. EXTRAORDINARY ECONOMIC CONDITIONS**
11 **MOTIVATING THE COMPANY’S CURRENT FILING**

12 **Q. WHAT HAS BEEN THE RECENT EXPERIENCE IN NATURAL GAS**
13 **USAGE PER CUSTOMER?**

14 A. For many US gas distributors, there has been a long-term trend of declining gas
15 delivery volumes per customer. This pattern is particularly evident for residential
16 customers. For example, one study by the American Gas Association (“AGA”) estimates that gas consumption per household has declined by about 1 per cent per
17 annum since 1980 in weather-normalized terms. This trend is due, in part, to
18 demand-side management programs, but it also depends greatly on the use of more
19 energy-efficient appliances, materials and insulation in new construction. All these
20 factors tend to reduce gas consumption per customer, on average.
21

22 **Q. HAS THE AGA UNDERTAKEN MORE RECENT RESEARCH ON**
23 **NATURAL GAS USAGE PER CUSOTMER?**

24 A. Yes. In March 2007, the AGA released a study titled “An Economic Analysis of
25 Consumer Response to Natural Gas Prices.” Using company-specific data for a
26 sample of 46 gas distributors, the AGA study estimated long-run and short-run price
27 elasticities of demand for residential customers. Among the study’s findings were the
28 following:

- 1 • Weather adjusted usage per residential customers fell by 13.1 per cent from
- 2 2000 through 2006
- 3 • The annual rate of decline in 2000-2006 was 2.2 per cent per annum; this was
- 4 more than twice the average rate of decline from 1980 to 2000
- 5 • The annual rate of decline accelerated further to 4.9 per cent per annum in the
- 6 2004 to 2006 period
- 7 • The decline in use per customer was experienced in all nine geographic
- 8 regions selected by the researchers; however, in the 2004-2006 period, the rate
- 9 of decline in New England exceeded that of the nation as a whole and also
- 10 exceeded the downward trend in usage per customer in six of the eight other
- 11 regions

12 **Q. DID THE AGA ESTIMATE HOW MUCH OF THE RECENT DECLINE IN**
13 **NATURAL GAS USAGE WAS DUE TO INCREASES IN NATURAL GAS**
14 **PRICES?**

15 A. Yes. Since 2000, the AGA estimates that at least 57% of the observed decline in
16 AUPC was due to residential customers reducing their consumption in response to
17 higher natural gas prices. The remaining decline in AUPC was due to enhanced
18 energy conservation and the use of more energy efficient appliances.

19 **Q. THE AGA STUDY IS BASED ON A SAMPLE OF GAS DISTRIBUTORS AND**
20 **APPLIES ONLY TO RESIDENTIAL CUSTOMERS. ARE THERE MORE**
21 **COMPREHENSIVE DATA THAT DEMONSTRATE THAT GAS USAGE**
22 **PER CUSTOMER HAS BEEN IMPACTED BY THE RECENT INCREASE IN**
23 **NATURAL GAS PRICES?**

24 A. Yes. I have examined trends before and after 2002 since, beginning in that year,
25 annual natural gas prices have generally increased steadily. The data I have reviewed
26 are more comprehensive than the study prepared for the AGA. My analysis also

1 utilizes official data from the US Energy Information Administration and is therefore
2 likely to be more comprehensive in terms of industry coverage.

3 For the US as a whole, gas usage per residential and commercial customers declined
4 by an average of 1.94% per annum over the 1997-2006 period. The trend decline in
5 AUPC was 1.5% per annum from 1997 to 2002. This declining trend accelerated to
6 2.31% per annum in the 2002-2006 period.

7 The data are even more striking for the Northeast region. For northeast gas
8 distributors, AUPC declined at a 0.43% rate from 1997 to 2002. In the 2002-2006
9 period, AUPC declined by 2.27% per annum. No other US region experienced an
10 acceleration of this magnitude during the 2002-2006 period, when natural gas prices
11 were generally increasing.

12 **Q. CAN BAY STATE CONTROL OR MANAGE THE IMPACT OF HIGHER**
13 **GAS PRICES ON CUSTOMERS' GAS USAGE?**

14 A. The Company can do very little to manage the impact of gas price increases on
15 AUPC. Gas distributors have no control over commodity prices for natural gas,
16 which are determined in the competitive marketplace. In Massachusetts, a
17 distributor's gas commodity costs are also essentially a pass-through item.
18 Distributors do not profit from the natural gas supplies that they procure on behalf of
19 customers.

20 **Q. DO YOU BELIEVE THE DECLINES IN NATURAL GAS CONSUMPTION**
21 **EXPERIENCED BETWEEN 2004 AND 2006 ARE LIKELY TO BE**
22 **TRANSITORY OR PERMANENT IN NATURE?**

23 A. I believe the declines in AUPC between 2004 and 2006 will be permanent. Clearly,
24 the decline in AUPC represents a long-term, industry-wide trend. The experience
25 between 2004-2006 represents an acceleration of this trend but cannot be seen as an
26 aberration, particularly because it resulted in large part in response to an
27 unprecedented increase in gas commodity prices. Even though natural gas prices

1 have moderated, the available economic evidence does not suggest that it would be
2 reasonable to expect natural gas consumption to rebound significantly. Indeed, it is
3 more reasonable to expect that the observed increase in gas commodity prices will
4 decrease gas consumption even more in the long-run than what was immediately
5 observed in 2005-06.

6 **Q. PLEASE EXPLAIN.**

7 A. Consumers have less ability to respond to higher natural gas prices in the short-run
8 than in the longer-run. When consumers first experience higher natural gas prices,
9 they may respond by “dialing back” their thermostats or otherwise using natural gas-
10 fired appliances only when necessary. In the longer-run, however, consumers will
11 change their behavior more significantly in order to reduce their natural gas
12 consumption. Higher natural gas prices will induce customers to improve the
13 insulation of their homes and accelerate their replacement of appliances that use
14 natural gas with more energy efficient models. These actions will further reduce
15 natural gas consumption, but they take time to be realized. However, it is well
16 established in the economics literature that the response to energy prices is greater in
17 the long-run than in the short-run. For example, the 2007 AGA study cited earlier
18 estimated that the long-run price elasticity of demand for natural gas (-.18) is twice as
19 high as the short-run price elasticity of demand (-.09). This means that the long-run
20 response to higher natural gas prices is twice as great as the immediate response.
21 Other studies have found an even greater discrepancy between long-run and short-run
22 customer behavior, with long-run price elasticities more than twice those measured
23 for the short run.

24 There is also a high probability that the recent moderation in natural gas prices will
25 prove to be temporary. In spite of the decline in AUPC for residential and
26 commercial customers, other demands for natural gas will continue to place upward
27 pressures on gas commodity prices. Foremost among these is the growing use of
28 natural gas as a fuel source for power generation. Many industry participants, such as

1 the New England ISO, project that gas-fired generators will account for an increasing
2 share of generation capacity.

3 For these reasons, I believe it is reasonable to believe that the decline in AUPC that
4 Bay State experienced between 2004 and 2006 is not part of the natural “ebb and
5 flow” in the natural gas industry. Experience and economic research implies that this
6 decline will be permanent and sustained. In fact, there is a high probability that there
7 will be even further declines in natural gas usage, even if natural gas prices do not
8 continue to rise. All else equal, a permanent and sustained decline in AUPC will lead
9 to persistent under-earning in the remaining years of Bay State’s PBR plan, as
10 demonstrated by my previous example.

11 **Q. WILL ANY OTHER FACTORS TEND TO DEPRESS BAY STATE**
12 **EARNINGS PERSISTENTLY DURING THE REMAINING YEARS OF THE**
13 **COMPANY’S PBR PLAN?**

14 A. Yes. In addition to the decline in AUPC that has been observed, Bay State’s ongoing
15 replacement of its bare steel infrastructure is likely to act as a drag on Company
16 earnings. The Company has embarked on a long-term program of accelerating the
17 replacement of its steel infrastructure capital assets. The costs of replacing this
18 infrastructure are accordingly also accelerating. As explained in the testimony of Mr.
19 Cote, Bay State believes it is important to accelerate the replacement of its bare steel
20 main and services in order to provide safe and reliable service to its customers. This
21 is clearly a sustained, multi-year program, so the associated costs of bare steel
22 replacement will further serve to depress earnings during the remaining years of the
23 Company’s PBR plan.

24 **Q. SINCE THE COMPANY INITIALLY PROPOSED ITS PBR PLAN, HAVE**
25 **THERE BEEN ANY DEVELOPMENTS THAT SUPPORT THE**
26 **REASONABLENESS OF THE COMPANY’S PROPOSED**
27 **INFRASTRUCTURE REPLACEMENT PROGRAM?**

1 A. I believe so. Most importantly, the Pipeline and Hazardous Materials Safety
2 Administration (“PHMSA”) has announced that it will issue a notice of proposed
3 rulemaking (“NOPR”) related to distribution integrity management programs
4 (“DIMPs”) for gas distributors. A report on DIMPs was issued in December 2005,
5 and a final NOPR is expected in the balance of this year. Although the NOPR is not
6 expected to impose prescriptive mandates on gas distributors, the December 2005
7 report did call on gas distributors to develop and implement an integrity management
8 plan, identify existing and potential threats, and identify appropriate measures to
9 mitigate risks. The attention by both industry and government to this issue implies
10 that DIMPs are an increasingly important public policy issue, and Bay State’s
11 accelerated infrastructure replacement program should be seen as a forward-looking
12 and pro-active initiative in response to these concerns, since it is designed to address
13 potential safety and reliability risks on the Company’s system.

14 **Q. BASED ON THIS INFORMATION, WHAT DO YOU CONCLUDE?**

15 A. I conclude that there has been a consistent decline in average natural gas usage for
16 residential and commercial customers. This decline has accelerated in recent years
17 due to the unprecedented increase in gas commodity prices. The declining AUPC
18 trend has been especially severe since 2004, which was the test year used to establish
19 Bay State’s current billing determinants. The accelerated decline has also been
20 particularly sharp for Northeastern gas distributors. Declining AUPC depresses
21 distributors’ revenues and adversely impacts their earnings. The declines in AUPC
22 since 2004 are likely to be permanent and therefore will be a persistent drag on Bay
23 State earnings. In addition, Bay State is in the middle of a long-term capital
24 replacement program, which is also serving as a drag on earnings. These conditions,
25 combined with the understanding that Bay State’s PBR plan (1) was not designed to
26 compensate the Company for declines in its AUPC; (2) was calibrated using data
27 from the 1990 to 2001 period; (3) includes “cast off” rates set using 2004 billing
28 determinants; and (4) includes an ESM that was not designed to mitigate the impact
29 of persistent under-earning, lead me to conclude that, unless the Department

1 addresses these factors, the Company will likely not have a reasonable opportunity to
2 earn its allowed rate of return during the remaining years of its PBR plan.

3 **IV. MID-TERM ADJUSTMENTS IN PBR PLANS**

4 **Q. HOW HAS THE COMPANY PROPOSED TO OFFSET THE**
5 **EXTRAORDINARY CONDITIONS IT HAS EXPERIENCED THAT**
6 **NEGATIVELY IMPACT ITS EARNINGS?**

7 A. The Company has proposed two adjustments to its rates to reflect the impact of
8 developments since the 2004 test year that was used to set cast off rates. First, Bay
9 State proposes to update its base rates to recover the revenue losses associated with
10 the decline in AUPC. The current 2006 billing determinants reflect a significantly
11 lower AUPC than was reflected in the 2004 test year, and the Company proposes to
12 update this AUPC and use actual customer numbers and consumption levels recorded
13 in 2006. Second, Bay State proposes to implement a Steel Infrastructure
14 Replacement (“SIR”) Charge (“SIRC”) that will adjust rates annually to reflect the
15 updated costs of bare steel replacement expenditures that were made since the 2004
16 test year.

17 **Q. ARE THERE PROVISIONS THAT ALLOW THE COMPANY TO MAKE**
18 **THESE ADJUSTMENTS TO ITS APPROVED PBR PLAN?**

19 A. Yes. The Department’s Order approving Bay State’s PBR plan includes an
20 “extraordinary economic conditions” provision that allows for changes in tariffed
21 rates during the term of a PBR plan. The Department discussed the appropriateness
22 of allowing such provisions as a means of mitigating the risks when companies, like
23 Bay State, are subject to a ten year PBR plan. The Department wrote that “(i)n terms
24 of Department precedent, when approving long-term PBR plans the Department has
25 taken note of remedies available to Companies under such plans. These remedies
26 have included a formal mid-term review and acknowledgement that companies retain
27 the option to petition the Department for changes in tariffed rates in reaction to

1 extraordinary economic conditions” (D.T.E. 05-27 at 400, citations omitted).
2 Provisions for adjusting tariffs in response to extraordinary economic conditions,
3 such as the sharp decline in AUPC in response to an unprecedented increase in
4 natural gas commodity prices, are therefore noted as being a well established
5 component of approved PBR plans.

6 **Q. DOES THE COMPANY INTEND TO USE THE “EXTRAORDINARY**
7 **ECONOMIC CONDITIONS” PROVISION ONLY FOR A ONE-TIME**
8 **ADJUSTMENT IN BASE RATES?**

9 A. To the best of my knowledge, yes. The Company is only proposing a one-time filing
10 to (1) update its base rates to reflect the change in AUPC from the 2004 test year, and
11 (2)implement the SIRC that will update the local distribution adjustment clause
12 (“LDAC”) rates annually to reflect the costs of SIR expenditures since 2004.

13 **Q. WILL A ONE-TIME USE OF THIS PROVISION BE SUFFICIENT IF THERE**
14 **IS A CONTINUED DECLINE IN GAS USAGE PER CUSTOMER?**

15 A. Yes. The Company will only need to use the extraordinary economic conditions
16 provision to reflect the one-time decline in AUPC between 2004 and 2006, not to
17 recover any subsequent declines in revenues due to declining AUPC. The reason is
18 that Department is currently undertaking an investigation into revenue decoupling for
19 all gas and electric distributors in Massachusetts. I believe it is reasonable to assume
20 that the resolution of D.P.U. 07-50 will lead to some type of decoupling mechanism
21 being approved statewide for energy distributors. Assuming that this is the case, the
22 approved decoupling mechanism would compensate companies for declines in AUPC
23 after 2006. It would not therefore be necessary for Bay State to petition again for
24 tariff adjustments to recover revenue losses due to declining gas usage following
25 implementation of the Department's directives set forth in D.P.U. 07-50.

26 **Q. GIVEN THE DEPARTMENT’S CURRENT PROCEEDING IN D.P.U. 07-50,**
27 **WHY IS IT NECESSARY FOR BAY STATE TO PETITION FOR A ONE-**
28 **TIME BASE RATE ADJUSTMENT NOW?**

1 A. The revenue decoupling proceeding in D.P.U. 07-50 will only adjust tariffs for
2 subsequent declines in AUPC, not for the declines that Bay State has already
3 experienced between 2004 and 2006. Bay State's earnings are currently being
4 negatively impacted by the consumption declines it has experienced. If the
5 Company's tariffs are not adjusted to reflect the decline in revenues, then the
6 consumption declines will continue to exert a negative drag on earnings, short of Bay
7 State filing a new base rate case. Any tariff adjustments resulting from D.P.U. 07-50
8 will therefore not be sufficient to reflect the decline in revenue Bay State has already
9 experienced. Mr. Yardley's and Mr. Ferro's testimony further discuss Bay State's
10 inability to offset earnings erosion due to declining AUPC with additional revenue
11 from new business opportunities.

12 **Q. HAS THE DEPARTMENT RECENTLY CONSIDERED THE ISSUE OF**
13 **ADJUSTING PBR PLANS BECAUSE OF THE IMPACT OF EXOGENUOUS**
14 **FACTORS ON GAS DISTRIBUTION COSTS OR REVENUES?**

15 A. Yes. The Department considered this issue in D.T.E. 05-66, where Boston Gas
16 requested the recovery of an increase in its bad debt expense stemming from the
17 recent increase in gas commodity prices.

18 **Q. PLEASE SUMMARIZE THIS FILING AND THE OUTCOME OF THE**
19 **PROCEEDING.**

20 A. In D.T.E. 05-66, Boston Gas argued that \$9,381,629 in its under-recovered bad debt
21 expense met the Department's standard for exogenous cost recovery and should be
22 recovered through the exogenous factor in its approved PBR plan. The company
23 claimed this was justified because 1) the increase in bad debt expense resulted from
24 higher gas commodity prices over which Boston Gas had no control; 2) the higher
25 bad debt expense resulted from changes in the natural gas marketplace that uniquely
26 affect the natural gas industry; and 3) the increase in bad debt expenses were not
27 captured in the GDP-PI.

1 The Department agreed with Boston Gas's claim that the increase in its bad debt
2 expense was due to unprecedented increases in gas commodity prices. The
3 Department also found that the impact of higher gas prices on gas-related bad debt
4 expense, and on the ability of distributors to recover such expenses, is unique to the
5 local gas distribution industry because distributors must purchase gas for customers
6 they are obligated to serve. The Department also agreed that the cost changes
7 associated with higher natural gas prices are not included in the GDP-PI as applied in
8 Boston Gas's PBR plan.

9 At the same time, the Department said that cost changes associated with natural gas
10 market conditions that uniquely affect the local gas distribution industry and are
11 beyond company control should not be construed as automatic grounds for exogenous
12 recovery. However, the Department allowed Boston Gas to recover gas-related bad
13 debt expense as an exogenous cost because: 1) it was under a PBR plan and could
14 not file a rate case to recover the costs; 2) the cost change is significantly above the
15 levels approved in Boston Gas's last rate case; 3) the cost change was associated with
16 a pass-through item (*i.e.* natural gas purchase costs); and 4) the cost change is not
17 included in the GDP-PI.

18 Furthermore, the Department ruled that there was "a larger question involved here,
19 larger than the working of regulatory formulas" (D.T.E. 05-66 at 15). Gas
20 distributors have an obligation to serve customers, and they are constitutionally
21 guaranteed the opportunity, given efficient management, to recover costs that are
22 reasonably and necessarily incurred to serve customers. This opportunity is necessary
23 for companies to maintain financial integrity and attract capital which, in turn, is
24 necessary to continue providing service to new and existing customers. It would not
25 be consistent with distributors' constitutional guarantees to deny cost recovery,
26 thereby harming a company's financial integrity, because of factors that are largely
27 beyond that company's control.

**Q. DO YOU BELIEVE THAT BAY STATE'S CURRENT PROPOSAL IS
CONSISTENT WITH THE PHILOSOPHY AND CRITERIA THE
DEPARTMENT DEVELOPED IN D.T.E. 05-66?**

A. Yes. The loss of Bay State revenues due to the decline in its AUPC is clearly beyond the Company's control. As previously discussed, Bay State's PBR plan was not designed to reflect any decline in AUPC or accelerated replacement of bare steel infrastructure, just as Boston Gas's PBR plan was not designed to accommodate an unexpected increase in bad debt expense. Bay State's distribution revenues are also lower than those approved in its last rate case, just as Boston Gas's bad debt expense was above that approved in its last rate case. The precipitating event that led to these consequences for both companies was the increase in gas commodity prices, which is a cost pass-through item.

**Q. PLEASE EXPLAIN WHY THE LOSS IN REVENUE IS BEYOND COMPANY
CONTROL.**

A. In the most general terms, while gas distributors have an obligation to provide delivery services to customers in their service territory, they have little ability to influence the volume of natural gas that is actually delivered to customers. Delivery volumes are ultimately determined by customers' demands. Gas distributors are obligated to deliver whatever volume of natural gas that their customers demand.

In recent years, the demand for natural gas has been negatively impacted by higher prices for the natural gas commodity. The negative impact of higher gas prices on gas usage for residential and commercial customers has been particularly evident in the Northeastern US, as demonstrated by Exhibit LRK-1. Therefore, the precipitating factor in Bay State's recent decline in AUPC, and its associated loss of revenues, is the increase in gas commodity prices and resulting changes in customer behavior. This is the same factor that the Department identified as being responsible for the increase in bad debt expenses for Boston Gas, for which the Department allowed exogenous recovery in D.T.E. 05-66. Furthermore, the decline in AUPC and

1 associated revenue impact is due to less gas consumption by Bay State's existing
2 customers, not to a loss of customers due to any inability to serve current customers
3 effectively.

4 **Q. DO YOU BELIEVE THE LINKAGE BETWEEN HIGHER GAS PRICES AND**
5 **LOWER DELIVERY VOLUMES IS STRONGER THAN THE LINK**
6 **BETWEEN HIGHER GAS PRICES AND INCREASED BAD DEBT**
7 **EXPENSE?**

8 A. I do, for several reasons. First, it is matter of fundamental economic theory that
9 higher prices for a good or service lead to a decline in the quantity demanded of that
10 good or service. Because it is a cost pass through item, Bay State can do nothing to
11 mitigate the impact of higher prices in the natural gas marketplace on the prices that
12 are charged for natural gas to its customers. Accordingly, there is a direct and
13 unavoidable linkage between changes in the market prices for natural gas and Bay
14 State's delivery volumes.

15 In contrast, the link between natural gas prices and bad debt expense is both more
16 indirect and more manageable. Unlike the close and inexorable link between prices
17 and the quantities that consumers demand, gas prices and bad debt expense are
18 connected through a longer chain of activities. Gas distributors first purchase natural
19 gas on customers' behalf, bill them for the quantities they consume, and observe that
20 customers fail to pay their bills in full before contacting these customers and
21 attempting to arrange for final payment. Only after the latter steps fail to eliminate
22 arrearages are debt expenses considered to be "bad" and written off. Thus, while
23 there is likely to be a link between changes in gas commodity prices and bad debt
24 expense, this relationship only becomes manifest through a series of interactions
25 between the distributor and its customers that unfolds over a considerable period of
26 time.

27 Relatedly, because high gas prices are linked to bad debt expense via a series of
28 distributor activities, gas distributors have some ability to manage this relationship.

1 Billing and collecting from customers are normal, ongoing business activities that
2 companies can control, *inter alia*, through their own collection efforts. A
3 distributor's ability to plan for and manage bad debt expense may also be heightened
4 by the fact that high gas prices are generally observable in advance of the winter
5 heating season, and managers can foresee that higher prices will affect customers'
6 ability to pay their bills during the peak winter months.

7 The nature of the linkage between gas prices and the quantity of gas demanded is
8 very different. This relationship depends almost entirely on the customers', as
9 opposed to the utility's, behaviors. Indeed, the relationship between prices and
10 quantities demanded is captured in the market demand curve, which is one of the
11 fundamental building blocks of economic analysis. The demand curve is also distinct
12 from the supply curve, which reflects producers' behavior in the marketplace. When
13 natural gas prices increase, consumers naturally respond by reducing their
14 consumption. Distributors have little ability to "manage" or offset this response. On
15 the contrary, they have an obligation to deliver whatever volumes of gas their
16 customers' demand.

17 In addition, for the reasons discussed, I believe that the decline in AUPC that Bay
18 State experienced is likely to be permanent rather than transitory in nature. Higher
19 gas prices lead consumers to change behavior in ways that are likely to make long-run
20 consumption declines even greater than those that are experienced immediately. This
21 change in long-run customer behavior also differs from what might be expected with
22 respect to bad debt expenses.

23 For all these reasons, I believe the conditions currently being experienced by Bay
24 State are less controllable, more significant, and more likely to lead to a sustained,
25 persistent drag on earnings than the conditions that were considered in D.T.E. 05-66.
26 All of these factors, in turn, make Bay State's economic conditions more
27 "extraordinary" than those that gave rise to the exogenous cost adjustment approved
28 in D.T.E. 05-66.

**Q. DO YOU BELIEVE THE “LARGER QUESTION” THAT THE
DEPARTMENT SAID WAS AT STAKE IN D.T.E. 05-66 IS EQUALLY
APPLICABLE FOR BAY STATE’S CURRENT FILING?**

A. Yes. In D.T.E. 05-66, the Department said that the “larger question” it was addressing was a utility’s ability to maintain its financial integrity and attract capital. The Department said it would not be consistent with utilities’ constitutionally guaranteed rights to deny the recovery of costs that are necessary to incur service but largely beyond company control, since doing so can undermine a company’s financial integrity and ability to attract the necessary capital to continue providing service. This rationale is equally applicable to the recovery of revenues. A \$3 million exogenous decline in revenues has an identical impact on a company’s earnings as a \$3 million increase in exogenous costs. The larger question that the Department said was at stake in D.T.E. 05-66 implies that if it is just and reasonable for a utility to be compensated for increases in costs because of exogenous increases in gas commodity prices, it is equally just and reasonable for a utility to be compensated for declines in revenues that result from higher gas commodity prices. In the case of cost changes, the proper mechanism for adjusting the PBR plan to recover those costs is the exogenous cost factor. The appropriate mechanism for adjusting the PBR plan to recover revenue declines in response to unprecedented gas commodity price increases would be the extraordinary economic conditions provision.

V. CONCLUSION

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. There has been a long-term trend of declining AUPC in the natural gas industry. This trend has accelerated in recent years, as consumption has fallen in response to an unprecedented increase in natural gas prices. The acceleration in declining AUPC has been even more pronounced for gas distributors in the Northeast US.

1 Bay State has petitioned for a one-time tariff adjustment in order to update its base
2 rates and to implement a SIRC. These regulatory solutions are necessary to recover
3 revenue losses due to both declining AUPC and higher capital replacement costs
4 relative to the 2004 test year currently used to set tariffs. The Company's proposal to
5 use the extraordinary economic conditions provision stated in the Department's
6 approval of its PBR plan is appropriate since, in the absence of such an adjustment,
7 there will be persistent, uncontrollable drags on Bay State earnings, and the Company
8 will likely not have a reasonable opportunity to earn its allowed ROE. The
9 Company's current PBR plan was not designed to deal with such extraordinary events
10 or sustained, under-earning outcomes. I believe the "extraordinary economic
11 conditions" provision is precisely designed to allow for one-time rate adjustments in
12 response to uncontrollable events that, if not otherwise rectified, would ultimately
13 impact both customers and shareholders adversely. Bay State's filing is also
14 consistent in principle with Department precedents on allowing mid-term adjustments
15 of PBR plans in response to exogenous events that adversely impact Company
16 earnings.

17 Bay State's filing is necessary even if decoupling is approved in D.P.U. 07-50, since a
18 decoupling mechanism would adjust only for further declines in AUPC and not
19 consumption declines that have already been experienced. Bay State's adjustment is
20 necessary to ensure that its reduced revenues do not exert a persistent drag on
21 earnings in the remaining years of its PBR plan. The Company's proposed one-time
22 tariff adjustment for extraordinary economic conditions will therefore contribute
23 towards the effectiveness of the PBR plan the Department approved in D.T.E. 05-27
24 and any decoupling mechanism that is approved in D.P.U. 07-50.

25 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

26 A. Yes.