Riverside Steam and Electric
DPU 88-123
Exhibit PLC-10

COMMONWEALTH OF MASSACHUSETTS
BEFORE THE DEPARTMENT OF PUBLIC UTILITIES

REBUTTAL TESTIMONY OF

PAUL CHERNICK
PLC, Inc.

ON BEHALF OF THE

RIVERSIDE STEAM AND ELECTRIC COMPANY

OCTOBER 3, 1989

Introduction

Q: Please state your name, position, and business address.

A: My name is Paul Chernick. I am President of PLC, Inc., Boston MA.

Q: Are you the same Paul Chernick who filed direct testimony in this proceeding?

A: Yes.

Q: What is the nature of your rebuttal testimony?

A: I will respond to one point raised in the rebuttal testimony of Mr. Curry, and to six points raised in the rebuttal testimony of Mr. Stillinger.

Mr. Curry's Comparison Contracts

Q: To which point raised in Mr. Curry's testimony did you wish to respond?

A: Mr. Curry presents in his Exhibit BEC-5 a list of contracts between Massachusetts utilities and QFs. That Exhibit was reproduced from a report by Massachusetts Electric Company (MECo), entitled "Alternate Energy Negotiation Bidding Experiment: 1988 Report." Mr. Curry noted that the MECo study reported that the Riverside contract was among the most expensive of the 22 contracts listed (representing 21 projects, since the Altresco project is listed as two separate contracts).

Q: What information should be added to Mr. Curry's description of those contracts?

A: Many of the projects listed in Exhibit BEC-5 were not comparable to Riverside in terms of likelihood of completion. The list includes many projects which are unlikely to be built, since they lack sites, financing, and/or zoning and environmental permits. Many of the projects have already been cancelled.

First, Mr. Curry should have noted that three of the 21 projects, including the lowest-priced coal unit, had been cancelled by the time the 1988 MECo report was compiled. Those three cancelled projects are noted in the column labelled [1] of Table R-1 attached to this testimony.

Second, the 1989 update to the MECo study ("Alternate Energy Negotiation Bidding Experiment") reports that another six of the projects have been cancelled, bringing the total cancellation rate in 1988-89 to nine out of 21. In addition, the owner of the Vicon project is in bankruptcy, making timely completion of that project unlikely.

Third, of the 21 projects, only two (Altresco and Northeast Landfill) are reported in the 1989 MECo study to be actually under construction. Of the nine survivors (excluding the nine cancelled projects plus Vicon) eight are still listed as being "in development," and one project is reported to be suffering from a "permitting delay." For eight of the nine projects not yet under construction, the forecast in-service dates slipped between the 1988 and 1989 reports, suggesting that they may have significant problems in siting, permitting, financing, or other pre-construction activities. (The in-

service dates for the two units now under construction have also slipped).

Summary of Responses to Mr. Stillinger's Testimony

Q: Please summarize the points you will cover in your response to Mr. Stillinger's testimony.

A: For the most part, Mr. Stillinger and I have little disagreement on the factual issues. While his testimony often states that he disagrees with me, his statements of WMECO's major assumptions and actions are generally consistent with my descriptions. There are only a few points which I believe warrant clarification.

First, I would like to correct any impression Mr. Stillinger may have left that oil prices account for the bulk of the variation in WMECO avoided cost estimates over time. Second, I will clarify the importance of WMECo's misstatement of its nuclear capacity factor projections. Third, I will respond to Mr. Stillinger's implication that the list of issues I discussed was artificially limited to WMECO's errors which understated avoided costs. Fourth, I will correct Mr. Stillinger's misrepresentation of my incorporation of DRI's high and low oil prices into the avoided cost calculation. Fifth, I will explain why Mr. Stillinger's critique of my earlier discussion of NU's economy sales is misleading. Sixth, I will discuss Mr. Stillinger's conclusion, and the adequacy of the data WMECO provided to the DPU.

Oil Prices and WMECO Avoided Cost Projections

Q: Mr. Stillinger's testimony, especially at page 19, might be read to imply that variations in oil prices have been the primary driving force in changes to WMECO's avoided-cost projections. Is this correct?

A: No. Table R-2 displays WMECO's projected avoided costs, in cents/kWh, and the corresponding DRI oil price projections for 1% sulfur #6 oil,[1] for the April 1986, October 1986, and December 1987 avoided-cost calculations. Table R-2 also displays an equivalent heat rate (the ratio of the avoided cost to the fuel price in cents/BTU) for each year for each projection. Finally, Table R-2 shows the present values and averages of the avoided costs and fuel prices for the period 1990-2009 (the longest period for which all three projections provide data), and the changes in those statistics between each pair of estimates.

Between the April 1986 and the October 1986 estimates, the oil prices fell 6.7% (in present value) to 8.3% (on average). WMECO's avoided-cost projection fell 22.6% to 20.4%, by the same measures. Clearly, oil prices were not responsible for the majority of the steep decline in avoided costs in this time period.

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[1]This is the same grade of oil Mr. Stillinger uses in his discussion.

Between the October 1986 and December 1987 projections, oil prices rose 5% in present value, or 2.7% on average. Avoided costs rose only 3% in present value, and actually fell 0.2% on average. The increase in oil prices produced only a modest increase in avoided cost, or none at all, depending on how we measure the result.

The picture which emerges from these fluctuations is that when oil prices fell, WMECO's estimates of avoided costs fell roughly three times as fast, but that when oil prices rose, avoided costs changed very little, perhaps falling slightly and perhaps rising half as fast as oil prices.

Q: Can the same relationship be perceived through other comparisons of the data in Table R-2?

A: Yes. If avoided cost varied simply with oil price, the equivalent heat rate in each year would remain the same. In fact, the equivalent heat rate for every one of the 20 projected years declined between the April 1986 and October 1986 estimates, by an average of 17% to 18%.[2] From the October 1986 to the December 1987 estimates, equivalent heat rates fell in 13 of the 20 years, resulting in an average decline of 1% to 2%.

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[2]The range depends on how the averaging is done, and whether it takes present valuing into account. For purposes of this discussion, the same point is made by any value in the ranges.

The Importance of Nuclear Capacity Factor Projections

Q: On page 10, Mr. Stillinger asserts that, had WMECO's December 1987 avoided cost runs used the nuclear capacity factors it told the DPU it was using, "the resulting avoided cost estimates would not have changed substantially." Is this a fair characterization?

A: No. On page 11, Mr. Stillinger admits that correcting the understatement of the December 1987 avoided costs due to the use of inflated nuclear capacity factors would increase the avoided costs by about 5%. I believe that both WMECo and the DPU would consider a 5% difference in costs to be substantial. According to WMECo's own analysis in the 4/26/88 letter from Curry to Tsongas, the difference between its projected avoided costs (with reference oil prices) and Riverside's proposed contract revision over 25 years was only 6%.

Riverside List of Issues

Q: Mr. Stillinger suggests that Riverside has only discussed issues which suggest that avoided costs were understated, and that Riverside has ignored issues which suggest that avoided costs were overstated. Is this a fair characterization?

A: No. All of the factors which WMECo misrepresented or failed to disclose to the DPU worked to understate avoided costs.

Q: On page 17, Mr. Stillinger lists four factors which he implies offset the underestimates in avoided costs due to the misrepresented, undisclosed, or erroneous assumptions you

identified in WMECo's avoided cost computations. Do these factors represent over-estimates of the avoided costs?

A: One factor represents some minor increase in avoided costs. This is Mr. Stillinger's item (2), which refers to WMECO's inability to update the carrying charge analysis in time for the December 1987 filing. WMECO has not provided an estimate of this effect, but it does not appear to be substantial.

Two other factors listed by Mr. Stillinger -- load forecast updates and fuel cost updates -- operate in opposite directions, but neither appears to be an error. The revisions in load forecasts have tended to raise avoided costs, and the revisions in fuel forecasts have tended to reduce avoided costs.[3] Both of these updates appear to be acceptable.[4] Mr. Stillinger does not appear to be criticizing his company's forecasts, so I do not believe that the inclusion of these two items is relevant to his argument.

Finally, Mr. Stillinger's assertion that reflecting NEPOOL interchange would decrease WMECO's avoided cost appears to be misleading, as I will discuss below under "NU's Economy

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[3]Mr. Stillinger does not explain why rising cost projections due to revised load growth forecasts and falling cost projections due to revised oil prices would both demonstrate that WMECo's avoided cost projections are overstated. His positions seem to be mutually inconsistent.

[4]I do not mean to endorse WMECo's specific adjustments. NU's load forecast still appears to be below recent historical experience, and may be somewhat understated. The inclusion of uncommitted conservation and load management in the load forecast may also understate avoided costs.

Interchange Sales."

Thus, the net effect of these factors is very small, and they may even represent net under-estimates of avoided costs, rather than the over-estimates Mr. Stillinger suggests.

Treatment of Oil Price Uncertainty

Q: On page 20, Mr. Stillinger criticizes your treatment of oil prices in your testimony. Can you describe his criticism and explain its relevance to the issues you raised?

A: I will try to do so. Unfortunately, it is difficult to determine the exact nature of his criticism. His discussion starts with a question which refers to Riverside not "calling to update prices from Fall 1987." It is not clear what the reference to "calling" is intended to mean, nor why the reasonableness of avoided cost projections in December 1987 should be judged by the oil price projections of Summer 1989, as Mr. Stillinger appears to suggest on the previous page.

Mr. Stillinger acknowledges in the second paragraph of his answer that QF contracts should be compared to low and high fuel prices, rather than just the reference fuel price used in WMECo's April 1988 rejection of the Riverside proposed contract. Thus, he seems to agree with me that the rejection was based on an incomplete analysis.

In the third paragraph of his answer, Mr. Stillinger attacks my comparison of the Riverside proposed contract to the average of the avoided costs produced by the three fuel

price projections, even though that average is clearly (by all of the arguments he proposes) more meaningful than the avoided cost based only on the reference fuel price. Mr. Stillinger does not explain how he would weight the three avoided-cost projections, or how he would propose that the DPU evaluate a contract which is close to the avoided cost under reference fuel prices, slightly less attractive under low oil prices, and much more attractive under high oil prices. For this purpose, NU has previously used a weighting scheme similar to that which I used.[5] His arguments about the non-linearity and risk of oil prices supports greater weight for the high- oil-price scenario, which would further increase the expected effective avoided cost.[6]

In summary, Mr. Stillinger's critique of my correction of WMECo's April 1988 analysis is garbled, and (to the extent that it can be deciphered) supports higher, rather than lower, avoided cost projections.[7]

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[5]The weights come from DRI's description of its forecasting methodology.

[6]Indeed, this was the purpose of the risk-adjusted discount rates I developed for RSECO's October 1987 filing in DPU 88-19. It is my understanding that the DPU agreed with me regarding the direction of the adjustment, but felt that an issue of this import should be dealt with in a generic proceeding, and did not accept the magnitude of the adjustment I proposed.

[7]In addition, Mr. Stillinger raises some confusing objections to the use of "statistics" and to my use in previous testimony of "non-linear curve-fitting techniques." I do not know what "statistics" he refers to, and I have replaced the curve-fitting techniques with WMECO's simple weighted-average technique, which produces similar results. While Mr. Stillinger darkly hints that I committed some methodological error, he does not identify any

NU's Economy Interchange Sales

Q: Mr. Stillinger asserts that NU's interchange with NEPOOL would justify lowering NU's avoided cost projections. Is he correct?

A: No. While the NEPOOL interchange was the basis the DPU chose for estimating the effect of off-system economy sales in DPU 84-276, the New England economy energy market has matured, and many economy energy transactions occur outside the NEPEX procedure. NU is now a net purchaser through NEPEX, but is a net seller through other economy transactions, and a net economy seller overall.

For example, let us examine 1987, a year for which Mr. Stillinger claims NU was a net purchaser.[8] WMECO has not yet provided the FERC Form 1 data for 1988, as requested in Riverside question 38. According to the FERC Form 1 for each of the three operating companies (WMECO, CL&P, and HWP), NU's net NEPEX purchases in 1987 were 970 GWH for $18.6 million, or an average price of $19.2/MWH. At the same time, NU was selling significantly more interchange power directly to other utilities, or by using NEPEX as an agent for its sales. For

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such error. Hence, I cannot provide any further clarification of these issues.

[8]As with his earlier statements to the DPU regarding nuclear capacity, Mr. Stillinger's testimony appears to say one thing, but largely says another. He refers to imports and exports with regard to NEPOOL, which might be taken to include all NEPOOL member utilities, but actually refers only to interchange through the NEPEX organization.

example, CL&P alone reported net sales through non-NEPEX interchange of 2,936 GWH for $139.7 million, or $47.6/MWH. WMECO sold another 217 GWH for $10.4 million, or $48.2/MWH.[9] Thus, NU reported selling three times as much interchange outside NEPEX as it reported purchasing within NEPEX, and for eight times as much money.

NU's reported interchange sales appear to include some transactions which might be classified as capacity sales. They also include nuclear outage transactions which involve no real energy, but appear to amount to the sale of kWh's for NEPEX billing purposes. Thus, the FERC Form data is difficult to interpret precisely.[10] However, even the "Other Power" category of interchange (which appears to represent only short-term economy energy sales) totals 1,094 GWH and $43.0 million, or $39.4/MWH.

Overall, NU does seem to be a net seller of energy, as measured by kilowatt-hours and certainly as measured by dollars, although most of these transactions take place outside NEPEX. Thus, Mr. Stillinger's discussion of this issue on pages 18-19, as well as his oblique reference to this issue on page 17 (his third point in the last paragraph), are incorrect and misleading. The same is true for his conclusion on page

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[9]HWP had no non-NEPEX interchange with unaffiliated utilities.

[10]Another problem is that NU may have listed some interchange purchases in the purchased power section of the FERC Forms. These amounts are significantly smaller than the corresponding sales, and in any case are already included in NU's production costing runs.

19 that my direct testimony omitted this issue because Riverside "recognized the weakness of their argument." I omitted the issue because I recognized that NU's data was not useable for this analysis, that a dominant portion of NU interchange no longer flowed through NEPEX, and that NU had not provided the DPU with a useful analysis of its current interchange situation.

The Adequacy of WMECO's Disclosures to the DPU

Q: On the last page of his testimony, Mr. Stillinger concludes that WMECo has never "intentionally withheld information used in its calculations of avoided cost estimates," and that WMECO has always provided any information requested. Is this a reasonable statement of the history of the Riverside contract proceedings and negotiations?

A: No. While I have no way of knowing WMECO's intentions, it is undisputed that WMECO withheld important information from the DPU,[11] misstated its nuclear capacity factor assumptions, and failed to inform the DPU that its decision in DPU 88-19 relied on incorrect information supplied by WMECO. Considering that WMECO did not disclose several major assumptions (and actively misled the DPU and Riverside regarding the nuclear capacity factor assumption), it is disingenuous at best to suggest that

[11]This is true for all three of the major factors discussed in sections 3-5 of my direct testimony.

WMECO would have documented those assumptions had it been asked about the basis for them. When Riverside filed discovery in this proceeding, WMECO initially refused to provide any information whatsoever.

WMECO has gone to extraordinary lengths to impede the ability of other parties to review its avoided-cost estimates. To the best of my knowledge, NU is the only New England utility (and one of the few in the country) which insists on keeping its production costing data under protective order. This is not the behavior of a public utility which welcomes public scrutiny.

Q: Mr. Stillinger claims that WMECO uses "a vast amount of information" in the development of its avoided cost projections, and that the key elements are routinely disclosed. Has WMECO voluntarily disclosed the key elements of its avoided-cost estimation process?

A: WMECO has certainly disclosed some key elements. However, the choice of disclosures is quite idiosyncratic. Most of the detailed documentation which WMECO provides relates to the carrying charges for capacity and capitalized energy charges. In the August 9, 1988 avoided-cost documentation, WMECO devotes 19 pages of tables (plus cover pages) to carrying-charge calculations, and another six pages to splitting the energy costs between peak and off-peak periods (a computation which is irrelevant for most QFs). This concentration on certain details of the analysis is in stark contrast to WMECO's failure

to provide a single page listing the changes in its important (and controversial) nuclear capacity factors, or to summarize the projected power purchases. The disclosures necessary to alert the DPU to WMECO's important decisions would not have been voluminous.

Q: Does this conclude your rebuttal testimony?

A: Yes.

TABLE R-1: QF CONTRACT STATUS UPDATE

MECO RANK	PROJECT NAME	FUEL	MW	COMMENTS/ ESTIMATED ON-LINE DATE 1988 [1]	PROJECT STATUS 1989 [2]	COMMENTS/ ESTIMATED ON-LINE DATE 1989
1	COMELEC PEPPERELL	GAS	38.0	1/1/91	IN DVT.	2/90
2	BECO CLEAN HARBOR	WASTE	2.5	1/1/91	CANCELLED	
3	MECO OXFORD	GAS	40.0	1/1/91	IN DVT.	1/92
4	COMELEC TONDU	GAS	40.0	6/1/91	IN DVT.	9/1/91
5	MECO ALTRESCO 91	GAS	25/161	1/1/91	UNDER CONSTR.	7/90
6	MECO NE LANDFILL	WASTE	12.0	1/1/89	UNDER CONSTR.	12/89
7	BECO BELLINGHAM	GAS	68.0	1/1/91	PERMITTING DELAY	1992
8	MECO O'BRIEN	GAS	46.0	1/1/91	IN DVT.	1992
9	BECO GULL MOUNTAIN	WASTE	2.4	9/1/88	IN DVT.	1990
10	MECO ALTRESCO 89	GAS	100/161	12/1/89	UNDER CONSTR.	7/90
11	BECO ATHOL 1	OIL	3.3	1/1/92	CANCELLED	
12	BECO URI	GAS	10.0	12/31/91	CANCELLED	
13	BECO WORCESTER 1	GAS	3.3	12/31/91	CANCELLED	
14	BECO WORCESTER 3	GAS	24.5	12/31/91	CANCELLED	
15	BECO PRS-MASS	WASTE	11.3	CANCELLED	CANCELLED	
16	BECO PRS-WEYMOUTH	WASTE	11.3	CANCELLED	CANCELLED	
17	BECO WEBSTER VICON	WASTE	7.4	1/1/90	DELAY	SEE [3]
18	BECO URBAN WOODS	WASTE	25.0	1/1/92	IN DVT.	1993
19	BECO AMER REF FUEL	WASTE	40.0	3/1/92	CANCELLED	
1A	MECO O'BRIEN COAL	COAL	24.0	CANCELLED	CANCELLED	
2A	MECO AES	COAL	81.0	1/1/92	IN DVT.	1993
3A	BECO BOS-MASS	COAL	200.0	1/1/92	IN DVT.	1994
4A	WMECO RIVERSIDE	COAL	34.0	REJECTED		

NOTES

[1]: FROM MECO "ALTERNATE ENERGY NEGOTIATION-BIDDING EXPERIMENT" 1988 REPORT, EXHIBIT 5, PP. 45-67.

[2]: FROM MECO "ALTERNATE ENERGY NEGOTIATION-BIDDING EXPERIMENT" 1989 REPORT, TABLE Q, APPENDICES 1-4.

[3]: SPONSORS' FILING FOR CHAPTER 7 PROTECTION 8/88.

TABLE R-2: OIL PRICES AND WMECO AVOIDED-COST PROJECTIONS

	APRIL 1986 ESTIMATE			OCTOBER 1986 ESTIMATE				DECEMBER 1987 ESTIMATE			
	AVOIDED COST	1% S #6 OIL	EQUIVALENT HEAT RATE	AVOIDED COST	1% S #6 OIL	EQUIVALENT HEAT RATE	CHANGE FROM PREVIOUS ESTIMATE	AVOIDED COST	1% S #6 OIL	EQUIVALENT HEAT RATE	CHANGE FROM PREVIOUS ESTIMATE
	(CENTS/KWH)	($/BBL)	(BTU/kwh)	(CENTS/KWH)	($/BBL)	(BTU/kwh)		(CENTS/KWH)	($/BBL)	(BTU/kwh)	
1990	3.3	19.05	10,775	2.7	18.76	8,952	-16.9%	3.2	22.81	8,726	-2.5%
1991	4.1	20.96	12,167	3.2	20.63	9,648	-20.7%	3.7	24.76	9,295	-3.7%
1992	4.4	22.86	11,972	3.4	22.51	9,395	-21.5%	3.4	26.56	7,962	-15.2%
1993	5.4	24.77	13,560	3.9	24.38	9,950	-26.6%	5.1	28.46	11,146	12.0%
1994	6.7	27.62	15,088	4.5	27.20	10,290	-31.8%	5.3	30.35	10,862	5.6%
1995	7.4	30.96	14,867	5.0	30.48	10,203	-31.4%	6.0	32.25	11,572	13.4%
1996	8.7	35.25	15,351	5.6	34.23	10,176	-33.7%	5.9	34.62	10,600	4.2%
1997	9.5	40.96	14,426	6.7	38.92	10,708	-25.8%	7.9	39.36	12,484	16.6%
1998	11.3	47.63	14,757	7.9	44.55	11,030	-25.3%	8.0	45.06	11,043	0.1%
1999	12.4	55.25	13,960	9.2	51.11	11,196	-19.8%	9.3	51.70	11,189	-0.1%
2000	14.1	63.82	13,742	11.1	58.62	11,778	-14.3%	10.9	59.28	11,437	-2.9%
2001	14.9	71.44	12,973	12.1	65.65	11,464	-11.6%	11.3	66.40	10,585	-7.7%
2002	16.6	81.44	12,678	13.6	73.62	11,490	-9.4%	12.5	74.46	10,442	-9.1%
2003	18.5	90.02	12,783	14.6	81.13	11,193	-12.4%	13.8	82.05	10,461	-6.5%
2004	19.3	98.59	12,176	16.1	90.04	11,122	-8.7%	15.2	91.06	10,383	-6.6%
2005	20.5	107.16	11,899	18.0	99.41	11,262	-5.3%	16.8	100.55	10,392	-7.7%
2006	22.4	117.64	11,844	19.8	108.32	11,370	-4.0%	18.2	109.56	10,333	-9.1%
2007	23.8	129.07	11,469	19.1	117.23	10,134	-11.6%	20.0	118.57	10,492	3.5%
2008	25.9	141.46	11,388	21.9	125.21	10,879	-4.5%	21.6	126.63	10,610	-2.5%
2009	28.9	153.84	11,685	23.1	133.18	10,789	-7.7%	23.0	134.69	10,621	-1.5%
2010	31.2			25.2				24.0	142.28	10,492	
2011	33.5			26.8				25.9	150.82	10,681	
2012	36.0			28.4				27.9	159.36	10,890	
2013	38.6			30.2				28.5	168.84	10,499	
2014	41.5			32.1				29.9	178.80	10,401	
2015	44.6			34.2				31.6	189.71	10,361	
NPV '90-2009 10.0%	85.9	413.9	12,907	66.5	386.2	10,710		68.5	405.3	10,511	
CHANGE FROM PREVIOUS ESTIMATE				-22.57%	-6.69%	-17.02%		3.00%	4.95%	-1.86%	
Ave '90-2009	13.9	69.0	12,978	11.1	63.3	10,652		11.1	65.0	10,532	
				-20.35%	-8.31%	-17.93%		-0.18%	2.69%	-1.12%	