

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
CONSUMERS POWER COMPANY)
)
(Midland Plant, Units 1 and 2) Docket Nos. 50-329
) 50-330

GILBERT S. KEELEY TESTIMONY CORRECTIONS

The following corrections should be made in the written testimony of Gilbert S. Keeley filed in this proceeding on November 5, 1976:

1. In Line 19 on page I-3, delete "grade".
2. In Line 20 on page I-3, delete "grade".
3. In Line 7 on page I-5, change "it" to "them".
4. In Line 9 of the third paragraph on page II-1, change "Exhibit 1" to "Exhibit 4".
5. In Line 2 on page II-2, change "6(e)" to "6(f)".
6. In Line 1 on page IV-1, change "Exhibit 16" to "Exhibit 17".
7. In Line 24 on page IV-3, change "7%" to "7 1/4%".
8. In Line 15 on page IV-4, delete "and" after "fuel" and insert "and insurance" after "taxes".
9. In Line 18 on page IV-4, add "Nuclear insurance costs were escalated at 4 1/2% per year." at end of the Line after "case".

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10. In Line 22 on page IV-4, add "through the remaining life of the Midland Plant." after "them"; delete "for 34 years".
11. In Line 5 of item 8 on page IV-4, change "Exhibit 15" to "Exhibit 16".
12. In Line 2 on page IV-5, add "and insurance" after "tax"; change "rate" to "rates"; change "was" to "were".
13. In Line 6 on page IV-5, change "Exhibit 18" to "Exhibit 19".
14. In Line 5 on page IV-6, change "suspension" to "continuation".
15. In Line 8 on page IV-6, change "Exhibit 19" to "Exhibit 20".
16. In Line 20 on page IV-7, change "Exhibit 20" to "Exhibit 21".
17. In Line 1 on page IV-8, change "Exhibits 21 and 22" to "Exhibits 22 and 23".
18. In Line 13 on page IV-8, change "2.66" to "2.73".
19. In Line 15 on page IV-8, change "2,59" to "2.66".
20. In Line 17 on page IV-8, change "one" to "the".
21. In the first column of item 4 of Exhibit 6C, page 1, add "Containment" after "Penetrating".
22. In the first column of item 5 of Exhibit 6C, page 1, change "Motor" to "Motion".
23. In the fourth column of items 35, 38 and 40 on Exhibit 6C, page 4, change "Exhibit 7A" to "Exhibit 6A".

24. In the first column of Exhibit 17 under Item 6A, change "1,061,600" to "1,061,000".
25. In the first column of Exhibit 17 under Item 6B, change "1,265,500" to "1,270,000".
26. In the first column of Exhibit 17 under Item 9B, change "1,323,000" to "1,231,000".
27. In the first column of Exhibit 17 under Item 10A, change "6,230,000" to "6,374,000".
28. In the first column of Exhibit 17 under Item 10B, change "767,000" to "775,000".
29. In the first column of Exhibit 17 under Item 11A, change "3,372,000" to "3,462,000".
30. In the first column of Exhibit 17 under Item 11B, change "1,108,000" to "1,120,000".
31. In the second column of Exhibit 17 under Item 6A, change "1,063,700" to "1,062,000".
32. In the second column of Exhibit 17 under Item 6B, change "1,268,500" to "1,272,000".
33. In the second column of Exhibit 17 under Item 9B, change "1,323,000" to "1,231,000".
34. In the second column of Exhibit 17 under Item 10B, change "766,000" to "774,000".
35. In the second column of Exhibit 17 under Item 11B, change "1,050,000" to "1,119,000".
36. In the third column of Exhibit 17 under Item 6A, change "1,120,000" to "1,119,000".
37. In the third column of Exhibit 17 under Item 6B,

- change "1,336,200" to "1,340,000".
38. In the third column of Exhibit 17 under Item 9B, change "1,420,000" to "1,322,000".
 39. In the third column of Exhibit 17 under Item 10B, change "820,000" to "828,000".
 40. In the third column of Exhibit 17 under Item 11B, change "1,193,000" to "1,205,000".
 41. In the fourth column of Exhibit 17 under Item 6A, change "1,063,500" to "1,063,000".
 42. In the fourth column of Exhibit 17 under Item 6B, change "1,271,700" to "1,273,000".
 43. In the fourth column of Exhibit 17 under Item 9B, change "1,323,000" to "1,231,000".
 44. In the fourth column of Exhibit 17 under Item 10B, change "760,000" to "768,000".
 45. In the fourth column of Exhibit 17 under Item 11B, change "1,101,000" to "1,112,000".
 46. In the fifth column of Exhibit 17 under Item 6A, change "1,158,400" to "1,158,000".
 47. In the fifth column of Exhibit 17 under Item 6B, change "1,305,000" to "1,387,000".
 48. In the fifth column of Exhibit 17 under Item 9B, change "1,488,000" to "1,385,000".
 49. In the fifth column of Exhibit 17 under Item 10B, change "850,000" to "859,000".
 50. In the fifth column of Exhibit 17 under Item 11B, change "1,242,000" to "1,253,000".

51. In the first column of Exhibit 20 under "Midland Plant - Operation & Maintenance" change "502" to "410".
52. In the first column of Exhibit 20 under "Midland Plant - Total Generation Cost" change "3,421" to "3,329".
53. In the second column of Exhibit 20 under "Midland Plant - Operation & Maintenance" change "502" to "410".
54. In the second column of Exhibit 20 under "Midland Plant - Total Generation Cost" change "3,333" to "3,241".
55. In the third column of Exhibit 20 under "Midland Plant - Operation & Maintenance" change "530" to "432".
56. In the third column of Exhibit 20 under "Midland Plant - Total Generation Cost" change "3,646" to "3,548".
57. In the fourth column of Exhibit 20 under "Midland Plant - Operation & Maintenance" change "502" to "410".
58. In the fourth column of Exhibit 20 under "Midland Plant - Total Generation Cost" change "3,238" to "3,146".
59. In the fifth column of Exhibit 20 under "Midland Plant - Operation & Maintenance" change "449" to "446".

60. In the fifth column of Exhibit 20 under "Midland Plant - Total Generation Cost" change "3,795" to "3,692".
61. In the first column of Exhibit 20 under "Alternative - Capital Cost" change "1,061.6" to "1,061.0".
62. In the first column of Exhibit 20 under "Alternative - Taxes & Insurance" change "495.0" to "503.0".
63. In the first column of Exhibit 20 under "Alternative - Fuel" change "6,230.0" to "6,374.0".
64. In the first column of Exhibit 20 under "Alternative - Total Generation Cost" change "8,720.1" to "8,871.5".
65. In the second column of Exhibit 20 under "Alternative - Capital Cost" change "1,063.7" to "1,062.0".
66. In the second column of Exhibit 20 under "Alternative - Taxes & Insurance" change "496.0" to "504.0".
67. In the second column of Exhibit 20 under "Alternative - Total Generation Cost" change "8,851.2" to "8,857.5".
68. In the third column of Exhibit 20 under "Alternative - Capital Cost" change "1,120.4" to "1,119.0".
69. In the third column of Exhibit 20 under "Alternative - Taxes & Insurance" change "522.0" to "530.0".
70. In the third column of Exhibit 20 under "Alternative - Total Generation Cost" change "9,435.4" to "9,442.0".
71. In the fourth column of Exhibit 20 under "Alternative - Capital Cost" change "1,063.6" to "1,063.0".
72. In the fourth column of Exhibit 20 under "Alternative - Taxes & Insurance" change "496.0" to "504.0".

73. In the fourth column of Exhibit 20 under "Alternative - Total Generation Cost" change "8,804.1" to "8,811.5".
74. In the fifth column of Exhibit 20 under "Alternative - Capital Cost" change "1,158.4" to "1,158.0".
75. In the fifth column of Exhibit 20 under "Alternative - Taxes & Insurance" change "540.0" to "549.0".
76. In the fifth column of Exhibit 20 under "Alternative - Total Generation Cost" change "9,800.7" to "9,809.3".
77. In the first column of Exhibit 21 under "Midland Plant - Operation & Maintenance" change "502" to "410".
78. In the first column of Exhibit 21 under "Midland Plant - Total Generation Cost" change "3,421" to "3,329".
79. In the second column of Exhibit 21 under "Midland Plant - Operation & Maintenance" change "502" to "410".
80. In the second column of Exhibit 21 under "Midland Plant - Total Generation Cost" change "3,333" to "3,241".
81. In the third column of Exhibit 21 under "Midland Plant - Operation & Maintenance" change "530" to "432".
82. In the third column of Exhibit 21 under "Midland Plant - Total Generation Cost" change "3,646" to "3,548".

83. In the fourth column of Exhibit 21 under "Midland Plant - Operation & Maintenance" change "502" to "410".
84. In the fourth column of Exhibit 21 under "Midland Plant - Total Generation Cost" change "3,238" to "3,146".
85. In the fifth column of Exhibit 21 under "Midland Plant - Operation & Maintenance" change "549" to "446".
86. In the fifth column of Exhibit 21 under "Midland Plant - Total Generation Cost" change "3,795" to "3,692".
87. In the first column of Exhibit 21 under "Alternative - Capital Cost" change "1,265.5" to "1,270.0".
88. In the first column of Exhibit 21 under "Alternative - Taxes & Insurance" change "590" to "602".
89. In the first column of Exhibit 21 under "Alternative - Fuel" change "3,372" to "3,462".
90. In the first column of Exhibit 21 under "Alternative - Total Generation Cost" change "6,407" to "6,513.5"
91. In the second column of Exhibit 21 under "Alternative - Capital Cost" change "1,268.5" to "1,272.0".
92. In the second column of Exhibit 21 under "Alternative - Taxes & Insurance" change "534" to "603".
93. In the second column of Exhibit 21 under "Alternative - Total Generation Cost" change "6,475" to "6,547.5".

94. In the third column of Exhibit 21 under "Alternative - Capital Cost" change "1,336.2" to "1,340".
95. In the third column of Exhibit 21 under "Alternative - Taxes & Insurance" change "623" to "635".
96. In the third column of Exhibit 21 under "Alternative - Total Generation Cost" change "6,861.2" to "6,877.0".
97. In the fourth column of Exhibit 21 under "Alternative - Capital Cost" change "1,271.7" to "1,273".
98. In the fourth column of Exhibit 21 under "Alternative - Taxes & Insurance" change "593" to "604".
99. In the fourth column of Exhibit 21 under "Alternative - Total Generation Cost" change "6,533.2" to "6,545.5".
100. In the fifth column of Exhibit 21 under "Alternative - Capital Cost" change "1,385.0" to "1,387.0".
101. In the fifth column of Exhibit 21 under "Alternative - Taxes & Insurance" change "646" to "657".
102. In the fifth column of Exhibit 21 under "Alternative - Total Generation Cost" change "7,091.3" to "7104.3".
103. In the first column of Exhibit 22 under "Alternative" change "8,720.1" to "8,871.5".
104. In the first column of Exhibit 22 under "Midland" change "3,421" to "3,329".
105. In the first column of Exhibit 22 under "Ratio" change "2.55" to "2.66" in both cases.
106. In the second column of Exhibit 22 under "Assuming Continuation - Alternative" change "8,851.2" to "8,857.5".

107. In the second column of Exhibit 22 under "Assuming Continuation - Midland" change "3,333" to "3,241".
108. In the second column of Exhibit 22 under "Assuming Continuation - Ratio" change "2.66" to "2.73".
109. In the third column of Exhibit 22 under "Assuming Continuation - Alternative" change "8,804.1" to "8,811.5".
110. In the third column of Exhibit 22 under "Assuming Continuation - Midland" change "3,238" to "3,146".
111. In the third column of Exhibit 22 under "Assuming Continuation - Ratio" change "2.72" to "2.80".
112. In the second column of Exhibit 22 under "Assuming Suspension" change "9,435.4" to "9,442".
113. In the second column of Exhibit 22 under "Assuming Suspension" change "3,646" to "3,548".
114. In the second column of Exhibit 22 under "Assuming Suspension - Ratio" change "Ratio-2.59" to "Ratio=2.66".
115. In the third column of Exhibit 22 under "Assuming Suspension" change "9,800.7" to "9,809.3".
116. In the third column of Exhibit 22 under "Assuming Suspension" change "3,795" to "3,692".
117. In the third column of Exhibit 22 under "Assuming Suspension - Ratio" change "Ratio-2.58" to "Ratio=2.66".
118. In the first column of Exhibit 23 under "Alternative" change "6.407" to "6,513.5".

119. In the first column of Exhibit 23 under "Midland" change "3,421" to "3,329".
120. In the first column of Exhibit 23 under "Ratio" change "1.87" to "1.95" in both cases.
121. In the second column of Exhibit 23 under "Assuming Continuation - Alternative" change "6,475" to "6,547.5".
122. In the second column of Exhibit 23 under "Assuming Continuation - Midland" change "3,333" to "3,241".
123. In the second column of Exhibit 23 under "Assuming Continuation - Ratio" change "1.94" to "2.02".
124. In the third column of Exhibit 23 under "Assuming Continuation - Alternative" change "6,533.2" to "6,545.5".
125. In the third column of Exhibit 23 under "Assuming Continuation - Midland" change "3,238" to "3,146".
126. In the third column of Exhibit 23 under "Assuming Continuation - Ratio" change "2.02" to "2.08".
127. In the second column of Exhibit 23 under "Assuming Suspension" change "6,861.2" to "6,877".
128. In the second column of Exhibit 23 under "Assuming Suspension" change "3,646" to "3,548".
129. In the second column of Exhibit 23 under "Assuming Suspension - Ratio" change "Ratio-1.88" to "Ratio=1.94".
130. In the third column of Exhibit 23 under "Assuming Suspension" change "7,091.3" to "7,104.3".

131. In the third column of Exhibit 23 under "Assuming Suspension" change "3,794" to "3,692".
132. In the third column of Exhibit 23 under "Assuming Suspension - Ratio" change "Ratio-1.87" to "Ratio=1.92".

In order to facilitate understanding of the changes numbered 24 through 132, revised Exhibits Numbered 17, 20, 21, 22, and 23 have been prepared which include these changes and have been attached to this list.

Estimated Abandonment Cost Data - \$1,000's

Description	Abandon Plant	Abandon Plant	Abandon Plant	Abandon Plant	Abandon Plant	Abandon Plant
	On 12/31/76	On 5/31/77	On 5/31/77	On 9/31/77	On 9/31/77	On 9/31/77
	Construction Continued To 5/31/77	Construction Suspended From 12/76 to 5/77	Construction Continued To 9/31/77	Construction Suspended From 12/76 to 9/31/77	Construction Continued To 9/31/77	Construction Suspended From 12/76 to 9/31/77
1. Plant Expenditures to Date	\$ 412,000	\$ 500,000	\$ 478,000	\$ 525,000	\$ 535,000	\$ 535,000
A. Salvage Value of Material	(45,000)	(52,000)	(52,000)	(58,000)	(58,000)	(58,000)
2. Plant Material and Subcontracts Committed But Not Paid	136,000	169,000	154,000	134,000	115,000	115,000
A. Cancellation Cost of Material and Subcontracts	56,000	57,000	58,000	41,000	40,000	40,000
B. Salvage Value of Material	(7,000)	(7,000)	(7,000)	(6,000)	(6,000)	(6,000)
3. Nuclear Fuel Cost Expenditures to Date	6,000	6,086	6,086	6,174	6,174	6,174
A. Fuel Cost Committed But Not Paid	118,600	118,514	125,933	118,426	130,731	130,731
B. Cancellation Cost of Fuel	86	88	88	70	70	70
C. Salvage Value of Fuel	(16,735)	(16,735)	(16,735)	(16,735)	(16,735)	(16,735)
4. Site Restoration Cost	59,000	76,000	59,000	101,000	59,000	59,000
5. Dow Dual Purpose Cost Reimbursement	(52,000)	(70,000)	(65,000)	(84,000)	(77,000)	(77,000)
6. Cost of Alternate (1600 Mw) Fossil Plant*						
A. Low Sulfur Coal	1,061,000	1,062,000	1,119,000	1,063,000	1,158,000	1,158,000
B. High Sulfur Coal	1,270,000	1,272,000	1,340,000	1,273,000	1,307,000	1,307,000
7. Purchase Power and/or Differential Power Cost From Midland Inservice Dates to Alternate Plant Inservice Dates*	661,000	75,000	596,000	829,000	582,000	582,000
8. Midland To-Go Capital Cost	1,258,000	1,170,000	1,337,000	1,075,000	1,385,000	1,385,000
9. Midland Operation Cost*	840,000	840,000	889,000	840,000	922,000	922,000
A. Fuel	1,231,000	1,231,000	1,322,000	1,231,000	1,385,000	1,385,000
B. Operation and Maintenance, Nuclear Insurance and Taxes	6,374,000	6,272,000	6,923,000	6,173,000	7,284,000	7,284,000
10. Alternate Plant Operation Cost (Low Sulfur)*	775,000	774,000	828,000	768,000	859,000	859,000
A. Fuel	3,462,000	3,407,000	3,760,000	3,353,000	3,956,000	3,956,000
B. Operation and Maintenance, Insurance and Taxes	1,120,000	1,119,000	1,205,000	1,112,000	1,253,000	1,253,000
11. Alternate Plant Operation Cost (High Sulfur)*						
A. Fuel						
B. Operation and Maintenance, Insurance and Taxes						

*See single asterisk footnote on Exhibit 20.

Cost to Complete and Operate Midland Vs
Cost of Abandoning Midland and
Installing and Operating Alternative Capacity (Low Sulphur Coal)

(Millions)*

	<u>To Complete at 12/1/76</u>	<u>To Complete at 5/1/77</u>		<u>To Complete at 9/1/77</u>	
		<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>	<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>
MIDLAND PLANT*					
Midland to-go Capital Cost	1,258	1,170	1,337	1,075	1,385
Taxes	768	768	835	768	883
Fuel	840	840	889	840	922
Operation & Maintenance	410	410	432	410	446
Nuclear Insurance	<u>53</u>	<u>53</u>	<u>55</u>	<u>53</u>	<u>56</u>
Total Generation Cost	3,327	3,241	3,548	3,146	3,692
	<u>Abandon at 12/-1/76</u>	<u>Abandon at 5/1/77</u>		<u>Abandon at 9/1/77</u>	
		<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>	<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>
ALTERNATIVE*					
Capital Cost	1,061.0	1,062.0	1,119.0	1,063.0	1,158.0
Salvageable Material	(61.3)	(68.9)	(72.3)	(75.3)	(81.4)
Dow Dual Purpose Cost Reimbursement	(70.8)	(92.8)	(90.4)	(109.0)	(108.1)
Cancellation Cost of Material and Subcontracts Minus Sal- vage Value (Net of Number 2A-2B)**	66.7	68.9	70.9	45.4	47.7
Site Restoration Cost	80.3	100.8	82.0	131.0	82.8
Purchasing Power and/or Differential Power Cost	661.0	775.0	596.0	829.0	582.0
Taxes & Insurance	503	504	530	504	549
Fuel	6,374	6,272.0	6,923.0	6,173.0	7,284.0
Operation & Maintenance	272.0	270.0	298.0	264.0	310.0
Nuclear Fuel Cost (Net of number 3 + 3B -3C)**	<u>14.4</u>	<u>(13.5)</u>	<u>(14.2)</u>	<u>(13.6)</u>	<u>(14.7)</u>
Total Generation Cost	8,871.5	8,857.5	9,442	8,811.5	9,809.3

*Costs are stated in future value dollars as of the date of commercial operation of Midland Unit 2, ie, columns 1, 2 and 4 @ 3/1/81, Column 3 @ 12/1/81 and column 5 @ 6/1/82.

**From Exhibit 17.

Cost to Complete and Operate Midland Vs
Cost of Abandoning Midland and
Installing and Operating Alternative Capacity (High Sulphur Coal)

(Millions)

	<u>To Complete at 12/1/76</u>	<u>To Complete at 5/1/77</u>		<u>To Complete at 9/1/77</u>	
		<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>	<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>
<u>MIDLAND PLANT</u>					
Midland to-go Capital Cost	1,258	1,170	1,337	1,075	1,385
Taxes	768	768	835	768	883
Fuel	840	840	889	840	922
Operation & Maintenance	410	410	432	410	446
Nuclear Insurance	53	53	55	53	56
Total Generation Cost	3,329	3,241	3,545	3,146	3,692
<u>Abandon at 12/1/76</u>					
		<u>Abandon at 5/1/77</u>		<u>Abandon at 9/1/77</u>	
		<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/76</u>	<u>Assuming Continuation of Construction</u>	<u>Assuming Suspension of Construction at 12/1/77</u>
<u>ALTERNATIVE</u>					
Capital Cost	1,270.0	1,272.0	1,340.0	1,273.0	1,387.0
Salvageable Material	(61.3)	(68.9)	(72.3)	(75.3)	(81.4)
Dow Dual Purpose Cost Reimbursement	(70.8)	(92.8)	(90.4)	(109.0)	(108.1)
Cancellation Cost of Material and Subcontracts Minus Sal- vage Value (Net of Number 2A-2B)**	66.7	68.9	70.9	45.4	47.7
Site Restoration Cost	80.3	100.8	82	131.0	82.8
Purchased Power and/or Differential Power Cost	661	755	596	829	582
Taxes & Insurance	602	603	635	604	657
Fuel	3,462	3,407	3,760	3,353	3,956
Operation & Maintenance	518	516	570	508	596
Nuclear Fuel Cost (Net of number 3 + 3B - 3C)**	(14.4)	(13.5)	(14.2)	(13.6)	(14.7)
Total Generation Cost	6,513.5	6,547.5	6,877	6,545.5	7,104.3

*Costs are stated in future value dollars as of the date of commercial operation of Midland Unit 2, i.e., columns 1, 2 and 4 @ 3/1/81, column 3 @ 12/1/81 and column 5 @ 6/1/82.

**From Exhibit 17.

Analysis III

Abandonment Ratio of Generation Cost of Midland with Generation cost of an alternative Generating Facility (Low Sulphur Coal)

	12/1/76	5/1/77	9/1/77
		Assuming Continuation	Assuming Continuation
Alternative Midland	$\frac{8,871.5}{3,329}$	$\frac{8,857.5}{3,241}$	$\frac{8,811.5}{3,146}$
	Ratio = 2.66	Ratio = 2.73	Ratio = 2.80
		Assuming Suspension	Assuming Suspension
		$\frac{9,442}{3,548}$	$\frac{9,809.3}{3,692}$
	Ratio = 2.66	Ratio = 2.66	Ratio = 2.66

Analysis III

Abandonment Ratio of Generation Cost of
Midland With Generation Cost of an Alternative
Generating Facility (High Sulphur Coal)

	12/1/76	5/1/77	9/1/77
		Assuming Continuation	Assuming Continuation
Alternative	$\frac{6,513.5}{3,329}$	$\frac{6,547.5}{3,241}$	$\frac{6,545.5}{3,146}$
Midland			
	Ratio = 1.95	Ratio = 2.02	Ratio = 2.08
		Assuming Suspension	Assuming Suspension
		$\frac{6,877}{3,540}$	$\frac{7,104.3}{3,692}$
	Ratio = 1.95	Ratio = 1.94	Ratio = 1.92