

kw., 230-volt D.C. generator. These engines were installed January 1, 1905. They weigh about 100,000 lbs. and cost approximately \$14,000 each.

The official acceptance test is given in the table shown on preceding page.

The oil consumption during the test averages 9.41 gallons per 100 kw. hours, which, with oil at 25 cents per gallon, is equivalent to 2.35 cents per kw.h.

During the year of 1910, 862,050 kw. hours were generated at a total fuel cost of \$2,695.98, the fuel being the ordinary distillate as obtained from Texas crude oil, and costing \$1.30 per barrel of 42 gallons, delivered. This oil has the following approximate characteristics:

Gravity, 37. Flash, 160. Fire, 190.

The operating expenses for the year were as follows:

|                              |                   |
|------------------------------|-------------------|
| Power plant wages .....      | \$3,014.00        |
| Fuel for power .....         | 2,695.98          |
| Water for cooling .....      | 37.07             |
| Lubricants and waste .....   | 526.38            |
| Miscellaneous supplies ..... | 63.78             |
| Engine maintenance .....     | 411.12            |
| <b>Total .....</b>           | <b>\$6,748.33</b> |

Thus, for the year 1910, the cost per kw.h. for fuel was 3.1 mills, and the total cost per kw.h. was 7.1 mills. This, while not including interest on the investment, depreciation, or other so-called overhead expenses, is cer-

**Diesel Engine—Operating Costs. 450 kw. Installation at Sherman, Texas. Cost of Production.**

COST IN MILLS PER K.W.H. HR.

| Month     | MAINTENANCE               |                 |                       |         | OPERATION |          |       |       |                 |           |       | Total Cost Dollars per Month | Total Cost Cents Per K.W. Hr. |
|-----------|---------------------------|-----------------|-----------------------|---------|-----------|----------|-------|-------|-----------------|-----------|-------|------------------------------|-------------------------------|
|           | Monthly Output K.W. Hours | K.W. Peak Load* | Load Factor Per Cent. | Engines | Total     | Fuel Oil | Labor | Water | Lubricating Oil | All Other | Total |                              |                               |
| 1912      |                           |                 |                       |         |           |          |       |       |                 |           |       | \$                           |                               |
| March     | 95,328                    | —               | 28.4%                 | None    | —         | 2.20     | 2.80  | 0.02  | 0.39            | —         | 5.31  | —                            | —                             |
| April     | 77,915                    | —               | 24.0%                 | “       | —         | 2.90     | 3.46  | 0.10  | 0.42            | —         | 6.88  | —                            | —                             |
| May       | 76,820                    | —               | 23.0%                 | “       | —         | 2.50     | 3.51  | 0.06  | 0.63            | —         | 6.70  | —                            | —                             |
| June      | 70,230                    | —               | 21.7%                 | 0.09    | 0.09      | 2.69     | 3.83  | 0.07  | 0.38            | —         | 6.97  | 559.43                       | 7.96                          |
| July      | 91,704                    | —               | 27.4%                 | 0.03    | 0.03      | 2.53     | 2.94  | 0.06  | 0.32            | —         | 5.85  | 738.20                       | 8.05                          |
| August    | 85,105                    | —               | 25.4%                 | None    | —         | 2.60     | 3.17  | 0.06  | 0.40            | —         | 6.23  | 808.35                       | 9.50                          |
| September | 105,506                   | —               | 32.5%                 | 0.03    | 0.03      | 2.71     | 2.56  | 0.08  | 0.36            | —         | 5.71  | 621.48                       | 5.83                          |
| October   | 117,360                   | —               | 34.7%                 | None    | 1.62      | 2.61     | 2.30  | 0.22  | —               | 0.51      | 5.64  | 854.13                       | 7.28                          |
| November  | 114,048                   | —               | 35.2%                 | “       | 0.81      | 2.46     | 2.00  | 0.24  | —               | 0.44      | 5.14  | 733.92                       | 6.43                          |
| December  | 117,499                   | —               | 35.1%                 | “       | 0.37      | 1.90     | 2.00  | 0.31  | —               | 0.36      | 4.57  | 551.19                       | 4.69                          |
| 1913      |                           |                 |                       |         |           |          |       |       |                 |           |       |                              |                               |
| January   | 115,212                   | —               | 34.1%                 | “       | 0.40      | 3.00     | 2.10  | 0.17  | —               | 0.37      | 5.64  | 717.26                       | 6.22                          |
| February  | 101,300                   | —               | 33.5%                 | “       | —         | 2.45     | 2.22  | 0.06  | —               | 0.36      | 5.09  | 517.12                       | 5.10                          |
| Total     | 1,168,027                 | —               | —                     | —       | —         | —        | —     | —     | —               | —         | —     | —                            | —                             |
| Average   | 97,335                    | —               | 29.6%                 | 0.05    | 0.478     | 2.54     | 2.74  | 0.12  | 0.40            | 0.41      | 5.81  | —                            | 6.78                          |

\* Total connected load, 1,553 k.w. No reliable record kept of peaks

**PHYSICAL DATA.**

H.P. Rating of Plant 675. No. of Engines 3. Size each 225 H.P.  
 Cost of Fuel Oil f.o.b. Plant per Bbl. \$1.05. Per Gallon .025  
 B.T.U. of Oil 18,000. Average Gal. Fuel Oil per K.W. Hr. .1020  
 Wages of men per day \$9.00. 1 at \$3.33. 1 at \$2.17. 1 at \$2.00. 1 at \$1.50

**Diesel Engine—Operating Costs. 450 kw. Installation at Cleburne, Texas. Cost of Production.**

COST IN MILLS PER K.W. HR.

| Month     | MAINTENANCE.             |                 |                       |         | OPERATION |       |          |       |       |                 |           | Total Cost Dollars Per M'nth | Total Cost Cents Per K.W. Hr. |       |
|-----------|--------------------------|-----------------|-----------------------|---------|-----------|-------|----------|-------|-------|-----------------|-----------|------------------------------|-------------------------------|-------|
|           | Monthly Output K.W. Hrs. | K.W. Peak Load* | Load Factor Per Cent. | Engines | All Other | Total | Fuel Oil | Labor | Water | Lubricating Oil | All Other |                              |                               | Total |
| 1912      |                          |                 |                       |         |           |       |          |       |       |                 |           |                              | \$                            |       |
| April     | 67,850                   | —               | 20.9%                 | None    | None      | —     | 3.08     | 4.79  | 0.40  | 0.38            | 0.07      | 8.72                         | —                             | —     |
| May       | 74,330                   | —               | 22.2%                 | “       | “         | —     | 3.29     | 4.37  | 0.38  | 0.64            | 0.06      | 8.74                         | —                             | —     |
| June      | 73,410                   | —               | 22.7%                 | 0.14    | “         | 0.14  | 3.19     | 4.42  | 0.46  | 0.50            | 0.07      | 8.64                         | 587.57                        | 8.00  |
| July      | 80,020                   | —               | 23.9%                 | 2.33    | “         | 2.23  | 3.20     | 4.06  | 0.44  | 0.46            | 0.06      | 8.22                         | 800.13                        | 10.00 |
| August    | 86,860                   | —               | 24.9%                 | 0.47    | “         | 0.47  | 3.09     | 3.74  | 0.49  | 0.72            | 0.06      | 8.10                         | 650.20                        | 7.48  |
| September | 89,130                   | —               | 27.5%                 | 0.08    | “         | 0.08  | 3.14     | 3.64  | 0.36  | 0.32            | 0.05      | 7.71                         | 673.18                        | 7.55  |
| October   | 100,580                  | —               | 30.0%                 | 1.32    | 0.16      | 1.48  | 3.03     | 3.11  | 0.30  | 0.43            | 0.05      | 6.92                         | 878.55                        | 8.73  |
| November  | 107,379                  | —               | 30.9%                 | 0.22    | 0.31      | 0.53  | 2.99     | 2.72  | 0.16  | 0.42            | 0.05      | 6.34                         | 746.31                        | 6.95  |
| December  | 123,030                  | —               | 36.7%                 | 2.03    | 0.03      | 2.06  | 3.03     | 2.59  | 0.42  | 0.38            | 0.04      | 6.46                         | 951.53                        | 7.73  |
| 1913      |                          |                 |                       |         |           |       |          |       |       |                 |           |                              |                               |       |
| January   | 127,170                  | —               | 37.9%                 | 0.72    | 0.72      | 1.44  | 2.96     | 2.23  | 0.72  | 0.22            | 0.04      | 6.17                         | 1102.97                       | 8.67  |
| February  | 98,430                   | —               | 32.5%                 | 1.64    | 0.01      | 1.65  | 3.00     | 3.20  | 0.28  | 0.56            | 0.05      | 7.09                         | 1010.52                       | 10.26 |
| March     | 106,270                  | —               | 31.7%                 | 1.30    | 0.24      | 1.54  | 2.98     | 2.91  | 0.24  | 0.30            | 0.05      | 6.48                         | —                             | —     |
| Total     | 1,134,459                | —               | —                     | —       | —         | —     | —        | —     | —     | —               | —         | —                            | —                             | —     |
| Average   | 94,538                   | —               | 28.8%                 | 1.02    | 0.24      | 1.17  | 3.08     | 3.47  | 0.39  | 0.44            | 0.05      | 7.46                         | —                             | 8.37  |

\* No record of peak loads available

**PHYSICAL DATA.**

H.P. Rating of Plant 675. Number of Engines 3. Size of each 225 H.P.  
 Cost of Fuel Oil f.o.b. Plant per Bbl. \$1.25 to \$1.64. Per Gal. .03 to .039  
 B.T.U. of Oil 18,000. Ave. Gal. Fuel Oil per K.W. Hr. .1020  
 Wages of men per day \$10.83. 1 at \$4.16. 2 at \$2.50. 1 at \$1.66.