

1 Q. Production evidence: Haynes Schedule 1: Why does the monthly conversion
2 rate vary so much at one particular load? For example, at a load in the range
3 of approximately 70 - 75 mw, individual conversion rates varied from 565 to
4 650 kwh / bbl.

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7 A. The monthly conversion factor is influenced by a number of factors other
8 than average unit load. These include the following:

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10 1. Operating Unit – The efficiency of all units is different. Therefore in any
11 given month the conversion factor will be different due to the combination
12 of units used.

13 2. Load Level – The range of loads the units were carrying during the month
14 influences the efficiency of the plant. For instance for an average of 70
15 MW the plant may have been operating with one unit at 50 MW, one at 70
16 MW and the third at 90 MW for the entire month. There are a number of
17 combinations of unit output level that results in the average unit loading.
18 The efficiency will be different for each combination.

19 3. Unit Fouling – The efficiency can be greatly affected by the state of the
20 boiler, air heaters, heat exchangers (condenser) and other systems in the
21 steam cycle. At the end of the production season there is a general
22 deterioration in the efficiency of these elements. Also there can be more
23 deterioration from one month to the next if power system conditions have
24 not provided opportunities to perform maintenance to address any fouling.
25 Maintenance outages to correct equipment deterioration are dependent
26 on system considerations such that continued operation in a less efficient
27 mode for extended periods of time is inevitable.

1 4. Fuel Consumption Measurements – The fuel consumption is determined
2 by dipping the tanks at the plant at month end. There are inherent
3 inaccuracies in the measurement of bulk storage tanks that can lead to
4 variances from month to month. These relate to adjustments for fuel
5 temperature and density. There can also be slight differences due the
6 variance in time between plant production meter readings and fuel
7 consumption readings.

8 5. Heat Content of the Fuel – The monthly conversion factor of kWh/bbl
9 does not consider the variance in the heating value of the fuel. Each
10 shipment of fuel will have slight variances in its heat content. Therefore
11 while the unit is just as efficient in converting the heating value of the fuel
12 to electrical energy, if the oil has a different heating value, the conversion
13 factor of a barrel of oil to electrical energy will be different.

14 6. Ambient Conditions – The efficiency of the plant can be affected by
15 ambient conditions. Air temperatures affect the combustion process and
16 the water temperature can affect cooling efficiency. These conditions
17 change monthly and by season.