

FIG. 9 ASH AND FLY-ASH DISTRIBUTION—PULVERIZED-COAL VERSUS CYCLONE-FIRED BOILERS

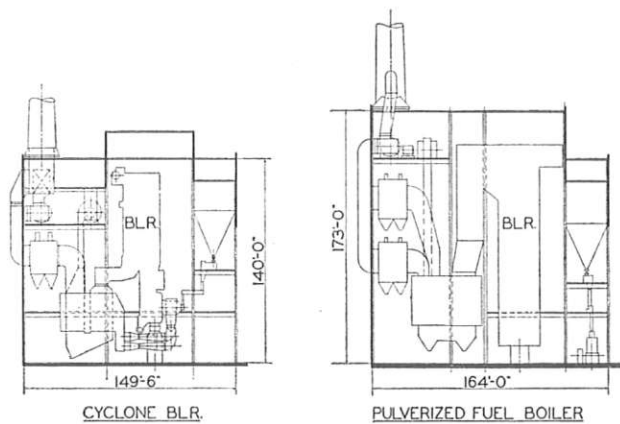


FIG. 10 COMPARISON OF SPACE REQUIREMENTS—CYCLONE BOILER VERSUS PULVERIZED-FUEL-FIRED BOILER

3 The gases passing through the boiler sections contain less dust, but the dust with Central Illinois coal is of such composition, high in alkalis, that it sticks to the surfaces. To date there has been no reduction in equipment and labor for cleaning the absorbing surfaces when burning Central Illinois coal. It is hoped that the use of tempering gas and other methods of cleaning will be successful and permit a reduction.

4 The cyclone-fired steam generator permits the use of a smaller unit for the same capacity, compared with other methods of combustion.

5 The cost of preparing coal for burning, both from the power and maintenance standpoints, is considerably less than for pulverizing coal. All of the troubles with coal conditioners outlined in the 1946² paper have been eliminated, and they are now considered very reliable and give long service between overhauls.

6 The elimination of induced-draft fans on the large generating

units has not been made, but it is hoped that this will become a possibility in the not too distant future. Smaller industrial boilers with cyclone furnaces are now operating successfully without induced-draft fans.

7 Fig. 10 shows a comparison between the size of the boiler room for a pulverized-coal-fired boiler and a cyclone-fired boiler. The cyclone-fired boiler takes approximately 10 per cent less floor area and 25 per cent less volume. This study was made for a boiler of 1,200,000 lb per hr capacity at 1800 psig, 1050 F throttle temperature, and 1000 F reheat steam. The boiler is used with a 150,000-kw turbine-generator unit. Our estimate for the complete installation, including building and equipment, shows a saving of approximately \$3 per kw in favor of the cyclone-fired steam generator, which is considerably lower than the anticipated figures of \$6 to \$6.50 given in the 1946 paper.²

Discussion

W. H. ROWAND,⁴ The authors have presented a fair and comprehensive evaluation of where the operation of cyclone-furnace boilers burning Kincaid coal stands today and of the differences in design between them and the new cyclone-furnace reheat units now on order.

It is evident from this presentation that when burning Kincaid coal we have not yet reached one of our original objectives, namely, to minimize the required cleaning of heat-absorbing surfaces.

We will continue our development until this objective has been attained, so that rightfully it can be added to the many other benefits which the cyclone furnace already offers for the more economical generation of power.

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