

FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

REPORT ON DUST COLLECTOR TESTS AT  
KELVIN POWER STATION DURING SEPTEMBER, 1957.

TECHNICAL MEMORANDUM NO.23 OF 1957.

By:

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WMI/C11/S

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1. INTRODUCTION:

The tests reported herein were carried out on behalf of Messrs. Davidson and Company, the suppliers of the dust collecting equipment, for the purpose of determining the performance of the installation.

The tests were performed concurrently with the boiler acceptance trial, the official tests taking place on September, 25th. and 26th., 1957.

## 2. DESCRIPTION OF APPARATUS AND TEST METHOD.

The operation of the dust collector was judged by weighing the total quantity of fine ashes collected by the equipment over a set period and by assessing the dust emitted from the boiler by sampling the flue gases at the dust collector outlet.

### 2.1 Fine Ash Collected.

Determination of the quantity of fine ashes collected was a straightforward operation and consisted of weighing all the dust deposited by the primary and secondary collectors in hoppers below the firing floor. To this effect, the normal discharge valves and ducting, attached to these hoppers, were removed and replaced by 4 in. pipes, one for each of the two hoppers. These pipes terminated in flexible canvas connections, fitted to sheet metal covers, tightly fitting standard dust-bins.

The ashes collected at the right and left-hand sides of the boiler were weighed at regular intervals, the results being given in Tables No. 3 and 6

### 2.2 Flue Dust Sampling Equipment.

Flue dust sampling was carried out iso-kinetically and in accordance with B.S. 893: 1940. For this purpose, the sampling head illustrated in Figure 1a, was used. The equipment comprises a Pitot tube, by means of which the flue gas velocity is determined and a sampling probe, through which the gas is exhausted at a velocity closely corresponding to that deduced from the Pitot tube indication. The gas then passes a miniature cyclone, in which most of the dust is precipitated, and finally a glass wool filter.

At the present tests, the rate of flow through the probe was derived from the pressure drop occurring in the cyclone.

In addition, the sampling head contains a thermocouple by means of which the flue gas temperature may be determined.

The complete assembly is supported by a thin walled steel tube of 2 in. diameter, through which the exhaust pipe, and measuring tubes and the thermocouple wires are passed.

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