

ELECTRICAL HAZARDS

Test equipment

Most electrical equipment is designed for safe operation under limited overload conditions for varying periods of time. Operators should be thoroughly familiar with the limitations of their equipment and should be trained to observe and report abnormal conditions. Continued overload may introduce additional operating hazards by causing fire, short circuits, circuit failures, or machine failures.

Through the use of various types of electrical testing meters, many of these conditions can be detected before they get out of control and cause damage.

The following types of equipment are standard and should be considered even by plants with limited budgets: split-core ammeter, voltmeter, ammeter, megohmmeter, ground fault indicators and locators, wattmeter, industrial analyzer, recording instrument, and specialized testing instruments.

The *split-core ammeter* can be used without tapping into the circuit. The instrument's core is slipped around the electric leads, and the scale is then read for the amount of current flow. A current reading in excess of the rated full-load current may indicate an overload or a grounded motor winding.

When test leads are used with this instrument, the line voltage can be checked to see if it equals the motor voltage rating. This check is important because low voltage can cause excessive current flow which may result in a complete breakdown, arcing, or electrical fires.

Voltmeter and ammeter When the voltage and current used in a plant exceed the range of a split-core ammeter, separate instruments should be used: a voltmeter to meas-

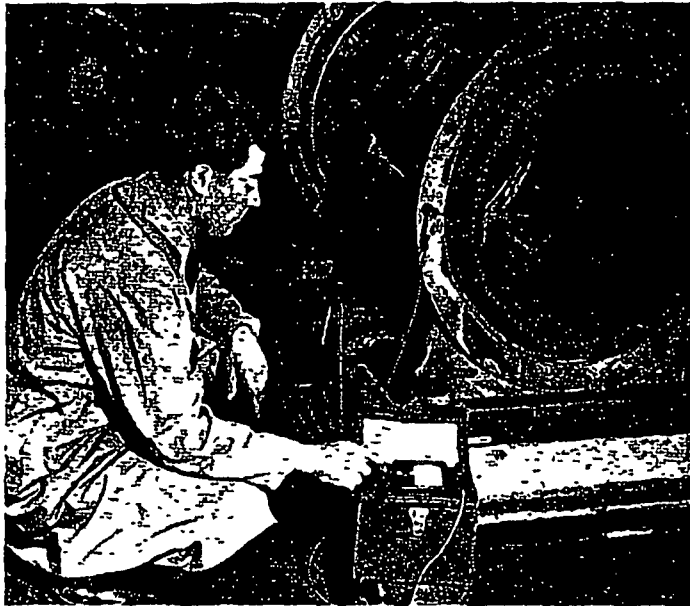


Fig. 31-8. An electrician checking equipment with an insulation resistance tester. His findings will be recorded on a chart similar to that shown in Fig. 31-9.

Courtesy Associated Research, Inc.

ure voltage and an ammeter to measure current. When these two instruments are used, more accurate readings can be taken. Also, separate instruments are useful when simultaneous voltage and current readings are needed. Such readings might be necessary when tests are being made to check on voltage surges or dips and unusual power conditions while current is on.

When the current to be measured exceeds the ammeter's range, shunts should be used. They are generally limited to direct current instruments and to current transformers for alternating current measurement. Likewise, when voltages exceed the voltmeter's maximum rating, resistors or potential transformers must be used to step down voltage.

The *megohmmeter* ("megger") is a high-scale ohmmeter which gives the value of insulation resistance. Almost every wire in a plant (including the wires on motors, generators, and transformers) is wrapped in electrical insulation.

Not all electrical insulation provides a