SPEAKING OF POWER

We can't help enjoying this characteristic bit of British understatement, from a paper dealing with the effects of atom bombs on naval vessels: "A further problem is presented by penetration into the living and working spaces of the ship of fission products drawn in by ventilator fans . . . or by convection . . . I need hardly add that at the present state of our knowledge *it is considered rather a bad thing to inhale fission products.*"

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Every so often some one with pessimistic leanings casts a worried eye on records of silt deposits in Lake Mead behind Hoover Dam (Hoover to Boulder to Hoover—remember?) and predicts the near doom of that power development. In the original planning, Bureau of Reclamation engineers made an extremely conservative estimate, assuming that: (1) no sediment flowed out of the reservoir (2) none deposited above spillway level, and (3) no reservoirs were created upstream. On this basis, known to be too pessimistic, it was estimated that it would take 200 years to silt up Lake Mead. Many other estimates of Lake Mead's silting rate have been made, and while they differ widely because of uncertainty as to the weight to be given the various factors affecting silting, they agree that the development will have a long life. Furthermore, changes now occurring in the area, and those in prospect upstream, are all favorable to a lower silting rate.

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Speaking before the New York Railroad Club, Gwilym A Price, Westinghouse president, revealed a 4-pronged attack on the problem of developing tomorrow's locomotives. Westinghouse is now: (1) working with B & W on an improved steam-turbine-electric locomotive, with a radically different high-pressure high-temperature boiler, hoped to reduce coal consumption by one-half (2) cooperating with Lima-Hamilton Corp on a free piston unit, using a power-gas generator under development for some time by Lima-Hamilton, and a Westinghouse 3000-hp gas turbine (3) building a gas turbine locomotive with two 2000-hp power units similar to the recently described experimental machine (POWER, Jan 1947, pp 98-102; March 1948, pp 80-82), and (4) planning for the Pennsy a new electric locomotive, half again as powerful as present largest units.

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With radioactive materials now available from AEC at relatively low cost, "tracers" are being used in industry as they have been for the past decade in laboratory research. In what was probably the first full-scale investigation of this kind, Arthur D Little, Inc, recently determined for Republic Steel Corp that of the two forms of sulphur in coal—pyritic and organic—both carry over equally into coke. For the test, artificial pyrites were made from radioactive sulphur and mixed with 12 tons of coal, normal charge to a coke oven. The proportion of the coke's sulphur that came from the pyrites (the "tagged" compound) was found by measuring its radioactivity.

Radioactive sulphur for this study cost only $50. Such full-scale testing would have been prohibitively expensive before the war when that much radioactive material would have cost thousands of dollars.

Use of tracers to *control* industrial processes looks interesting also. For example, radioactive phosphorus added to a Bessemer converter would show when the last impurity, usually phosphorus, has been removed. Radiation-sensitive automatic controls would then turn down and shut off the Bessemer as desired. In spite of need for strict safety precautions in their use, radioactive tracers face a brilliant industrial future. What will be the first use in the power field?

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Although there are as many predictions as there are experts, all agree that prospects for further tremendous expansion in power production, along with development of the synthetic fuels and chemicals industries, mean need for vastly increased coal output in years ahead, and greatly reduced mining costs. This is the background behind the coal industry's recent launching of an engineering program to develop a machine that will cut coal "off the solid" without use of explosives and load continuously into a conveyor or mine cars. Under direction of Bituminous Coal Research, the project has the support of 70 of the nation's leading coal producers, coal-land companies and railroads. Timetable calls for evolving a basic design for a practical machine in two years.

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POWER's new sister publication *Operating Engineer*, has been gaining paid circulation at a phenomenal rate—more than 12,000 in less than 10 months. This naturally makes the editors feel good, but they got perhaps their biggest kick out of an inquiry from a power engineer in the British West Indies. He wanted to subscribe, he said, because he had run across a page of *OE* in the wrapping of a motor shipped from the U. S. It happened to be Phil Swain's editorial in the first issue, setting forth the plans for the new magazine. Our BWI friend said that was enough to show him that *OE* was the magazine he needed. Some thrifty manufacturer no doubt put his checking copy to one last use in shipping, inadvertently became *OE's* salesman.

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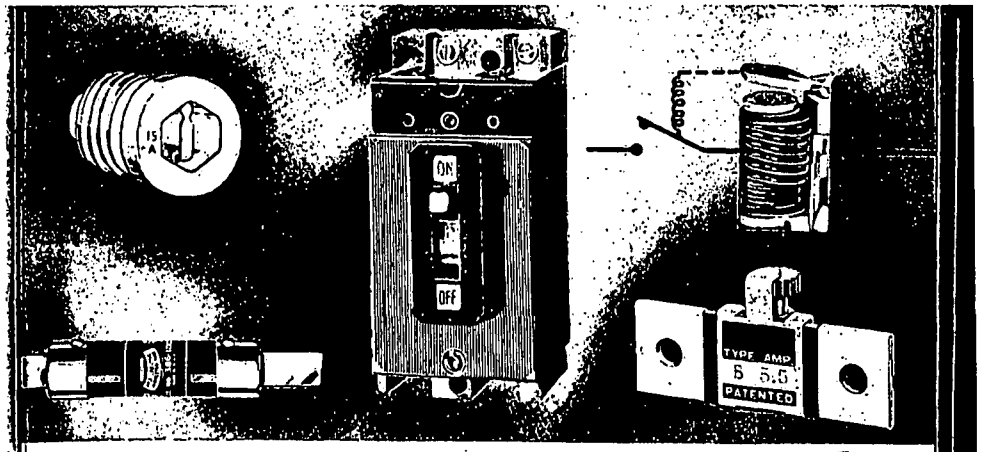
The Central Electricity Board of Great Britain has ordered another 15,000-kw gas turbine. This one, for Dunston power station of the North-Eastern Electricity Supply Co, will be built by C A Parsons and Co, Ltd. It has also been revealed that the 12,500-kw closed-cycle plant being built by John Brown and Co, Ltd, under Escher Wyss license, is to be installed by the North of Scotland Hydro-Electric Board and is expected to be running in 1950.

Metropolitan-Vickers Electrical Co announces it is building a 2000-kw gas-turbine set for standby service in its main works power station at Trafford Park, Manchester. It is an open-cycle unit, with regenerator.

THIS MONTH'S COVER

To dramatize low-voltage circuit protection, subject of a 16-page special section beginning on page 79 of this issue, McGraw-Hill photographer Syd Karson took the switchboard shot on POWER's cover. An operator is shown closing a panel-type circuit breaker feeding the dc bus.

Feeder breakers to either side of the operator are equipped with relays, which allow each circuit breaker to reclose automatically after tripping, provided the fault has cleared. Breakers shown are normally controlled from a remote point through a supervisory selector system.



CIRCUIT PROTECTION

By J J O'CONNOR, Assistant Editor

Every engineer recognizes that protective equipment is necessary to guard circuits and machines against abnormal conditions. Damaged equipment and extended interruption of production result from poor selection and improper maintenance of devices designed to guard electrical equipment and machinery. Since electrical protection is a form of insurance, an understanding of the operating principles as well as types of devices available is necessary for intelligent selection and use.

To aid in the understanding, selection and application of overcurrent protective devices used in low-voltage circuits, POWER has prepared this, its sixty-eighth, special section.

The needs of practical power engineers have been kept foremost in mind in writing the text as well as selecting illustrations. No attempt is made to cover all protective devices, discussion being restricted to overcurrent protection in circuits of 600 volts and below. This presentation divides into four parts: fuses, circuit breakers, thermal and magnetic devices, and applications. Since the power engineer is interested in good maintenance as well as design and selection, many practical field-tested hints are included to aid in troublefree operation.