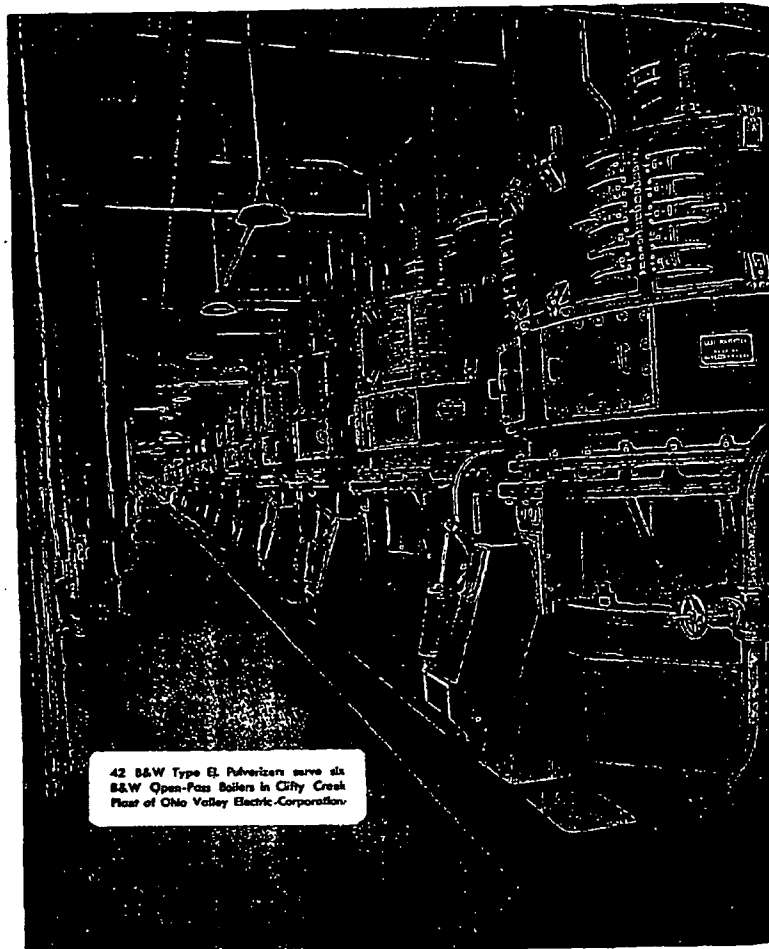


Have You Investigated

THE MODERN B&W



42 B&W Type E1 pulverizers serve six B&W Open-Face Boilers in City Creek Plant of Ohio Valley Electric Corporation.

SPECIAL REPORT

(Advertisement)

Fabri-Seal Insulation Failure Investigated

Introduced by Elliott in 1948. Achieved 8-year field service record. First failure occurred in 1957. Causes investigated by Elliott engineers.

The Elliott Company, which takes pride in the service record of its stator coil insulation for large induction motors, had some explaining to do this fall when its much-publicized Fabri-Seal insulation experienced its first failure.

Fabri-Seal insulation was introduced in 1948, installed in motors serving utilities and industries all over the country. According to Elliott's Ridgway sales management, "these motors shattered all previous field service records with not one insulation breakdown in over 8 years." Then in late 1957 the first failure occurred. Elliott engineers were quick to launch an investigation to determine what had happened to spoil such a splendid record.

Over 1,900,000 hp installed

An analysis of the tabulated field service records confirm that since 1948 more than 1,900,000 hp of Elliott's large motors with Fabri-Seal insulation were put into service and that none of them experienced an insulation breakdown in nearly 8 years.

Briefly, this insulation system includes sealing of coil slot sections with hand-wrapped Mylar[®]-backed mica; plastic-sealing at vulnerable points, vacuum preconditioning and pressure impregnation, turn-to-turn testing at high surge voltages, immersion of the complete stator in insulating varnish and subsequent baking. Obviously, it also involves new materials and fabrication methods, as well as thousands of man-hours tabulating and analyzing accelerated life-testing of hundreds of insulation systems.

Not one electrical failure in over 8 years

The fact that not one of these machines experienced an insulation failure in over 8 years was prominently exploited in literature, advertisements

and in personal contacts. At the height of this promotion the first Fabri-Seal insulation failure occurred. After recovering from the initial shock, the sales management was quick to point out—and rightly so—that a failure had to happen sooner or later and that this did not in any way nullify the 8-year field service record.

First insulation failure occurred in 1957

The insulation failure occurred in a motor serving a Gulf Coast chemical plant. Elliott engineers hastened to the scene and found that the atmosphere was laden with highly-corrosive, hygroscopic magnesium chloride dust.

When this corrosive dust blanketed the winding, it absorbed moisture to an almost unbelievable extent. Failure occurred right after a torrential down-pour deluged the area with 11 in. of rain in a 24-hour period, bringing the humidity in the area near 100%. Although the weather-protecting enclosure kept out the rain, the magnesium chloride with its water-absorbing action literally "sucked" the moisture out of the air onto the coils.

"In effect," the engineers reported, "the motor has been operating in a brine solution, practically the equivalent of being submerged. Furthermore, the corrosive dust had attacked the paint, steel baffles, and even brass name plates."

It must be said, however, that at no time did the Elliott engineers blame the failure on the severity of the operating conditions. At the same time, they were still not convinced that Fabri-Seal insulation was at fault. In their opinion, Fabri-Seal coil insulation simply would not fail—even in

such highly-corrosive and moist atmospheres.

How Elliott engineers solved the problem

With the customer's permission, the motor was returned to the factory for further investigation. After careful examination, Elliott engineers announced that "the motor revealed irrefutable evidence of faulty materials and workmanship,"—quite an embarrassing thing to have to admit.

"Our only consolation," Elliott engineers reported, "was that this failure occurred in what our customer described as 'the world's most severe insulation application' where every major make of motor has been installed . . . and has failed in less than one year of operation."

The Elliott Company promptly re-wound the stator coils with Fabri-Seal insulation, gave all mechanical parts additional treatment for corrosive conditions and returned the motor to the customer for service.

Although this failure broke the continuous service record that started in 1948, Elliott sales management reported that, "it did not reveal any basic weakness in the Fabri-Seal Insulation System."

Elliott's continuous insulation research

Even while Elliott Fabri-Seal insulation was establishing the 8-year field service record, Elliott engineers were busy life-testing a new Super-Fabri-Seal insulation. The results of these tests forecast a new era in large motor service life. They were made over a period of nine years, are now being tabulated and complete details will be released at an early date.

ELLIOTT Company

Ridgway Plant, Ridgway, Pa.

ADS OUT