

ELECTRICAL DEPARTMENT
ANNUAL REPORT
YEAR 1944

CLIFFS SHAFT MINE (Cont'd.)

Reconditioning of the 125 H.P. crusher motor was also taken care of during the shutdown for repairs to the crusher during the last several days of 1944.

MAAS MINE

Several minor delays have occurred at the Maas Mine during the year due to compressor motor and exciter difficulties. The slip ring troubles have been eliminated by the use of more brushholders permitting the use of more brushes with improved spring tension and better contact surface.

Compressor stoppages have occurred twice on account of commutator insulation breakdown on the exciter armatures. This has not caused any serious delay because there has been a haulage generator available to furnish D.C. during the repair period.

The most serious delays were those caused by the burnout of coils in the stator of the #2 compressor motor. There are now seven coils cut out of this motor and 2 coils out of #1 motor. The No. 1 motor is in fair condition but No. 2 has a great number of charred coils with the probability that these coils may break down between turns. In view of the fact that we have seven motors of this type, a complete set of coils with all the necessary wedges and insulating material should be on hand to care for an emergency that will surely arise.

The rotor shaft of the 700 H.P. skip hoist motor broke in the coupling causing a shutdown of the mine on April 24th. The spare rotor bought from Westinghouse in 1938 was put in this motor and the rotor with the broken shaft was shipped to the Westinghouse shops in Milwaukee for repairs. When the repair job was completed and the rotor returned to the mine on Aug. 24th it was unloaded on the engine house floor and is still there waiting for a coupling. In view of the fact that the rotor now operating is in poor condition on account of its having several patch jobs in the winding, it is recommended that this coupling job be taken care of as soon as possible.

Haulage operations have been carried on for the past year without much difficulty, the greatest expense being repairs to U. G. locomotives.

Some repairs were made to the generators in the engine house and a complete rewind has been made on the 215 H.P. Synchronous motor on the #1 haulage M.G. set.

The 6th Level has been connected to the main haulage system with a #4/0 cable through the winze from the 5th level, in addition to the #4/0 feeder through the main shaft.

Repairs to the 400 H.P. cage hoist motor have been made, including repairs to the winding, rewedging of the coils, new bearings, turned slip rings and the build up of the shaft to fit same coupling as the spare 400 H.P. hoist motor from Lake Mine storage. This spare motor was used for the cage hoist while repairs were made to the regular motor.

Hoisting operations have stopped at the winze between the 5th and 6th level since the 6th level drift was completed to the main shaft. The #2-3 conductor 2300 volt cable, feeding this hoist equipment, is still in place and is now being used to feed the A.C. motor on the Worthington pump.

This 6th Level pump set up with float and magnetic switch for automatic control was installed in July of 1944 for 440 volt operation with 2300 volt cable through the winze from the hoist panels on the 5th level and 2300/440 volt transformers near the pump on 6th level.

ELECTRICAL DEPARTMENT
ANNUAL REPORT
YEAR 1944

NEGAUNEE MINE

Hoisting operations at Negaunee Mine have moved along quite smoothly during 1944, the only break other than routine repairs being a break in the rotor circuit of the 350 H.P. induction motor of the old flywheel set. This was repaired on the job in about four days with no delay to regular operations.

Haulage equipment has functioned during the year with regular locomotive repairs and cable extensions. Since the 14th level has become one of the larger operating levels with six locomotives and most of the blowers and scraper machines, the best voltage obtainable must be at this part of the mine. For best results, both 400,000 C.M. shaft cables have been tied in parallel to the 13th level with one feeder from this point to the 14th level through the main shaft. Another feeder connects the 13th and 14th levels through a raise about 1200 ft. from the shaft.

The 150 K.W. Westinghouse haulage set has been repaired while the 200 H.P. M.G. set carried the full load. Most of this work was on the armature of the generator which required rebanding and rebuilding of equalizer connections and risers.

Some changes were made in the 2300 volt power circuit from the engine house to the shaft house during the summer to furnish power for the new electric shovel. The old #6 armored power cable for shaft house power and lights was replaced with a new #2/0 cable. The circuit breaker was set up for the higher current requirement and ground protection was also provided.

Regular shovel cable was not available so #4 steel armored cable was purchased from the storehouse for this purpose until the regular cable is delivered.

CAMBRIA-JACKSON MINE

Many changes have taken place and much rebuilding has been done at this mine during the year. The hoisting machinery has been the cause of several delays, mostly from breaks in the motor, grids and control panels.

The motor difficulties have arisen largely from failure in slip ring insulation, brushholder contacts and tension springs. The most serious break, however, occurred in the winding of the rotor on Dec. 28th when it was necessary to ship the entire motor to the General Shops for a four day repair job.

The grids are being rebuilt as time permits without delay to hoisting operations. The arc shields, contactors, relays and blow-out coils are also being renewed as soon as material is available.

The haulage equipment at this mine was in very poor condition when taken over in 1943.

Power was furnished for all D.C. purposes by the #1 haulage set which is a 150 K.W. generator driven by a 225 H.P., 2300 volt induction motor. The motor was in bad shape with several coils cut out of its stator winding. Poor bearings and a patched up D.C. armature were also causing plenty of trouble. This entire motor generator set was rebuilt in the General Shops and is now in good condition. In order to keep the mine operating while repairs were made, the #2 generator in the old engine house was rigged up with a 250 H.P. induction motor brought from the Princeton Mine storage. This motor was formerly used for the Stephenson Mine Prescott pump.

This #2 M.G. set was finally moved into the new engine house and the panels and starters so arranged that the mine may run from either set.

ELECTRICAL DEPARTMENT
ANNUAL REPORT
YEAR 1944

CAMBERIA-JACKSON MINE (Cont'd.)

Most of the hauling is now being done on the bottom level with three Goodman locomotives which have been rebuilt in our shops since the mine was taken over. The fourth locomotive from this level is now in the shops. In order to improve the D.C. voltage throughout the mine, #4/0 trolley wire has been used exclusively to replace smaller lines, also while the mine was shut down for repairs to the headframe in the month of May, a new section of 500,000 C.M. cable and inclosed disconnecting switches were installed in the headframe.

Control wiring and cables in the basement of the engine house have been changed to conduit and junction boxes for all hoisting and haulage circuits.

LLOYD MINE

The 500 H.P. skip hoist motor was overhauled and the bearings checked. A set of bearings from the Maas Mine Prescott pump motor were installed in this motor and its bearings sent to the General Shops to be repaired and used as spare for both of these motors as well as the Maas cage hoist motor.

The primary contactor panels for both skip and cage hoists have been furnished with repaired arc shields and new arc chutes.

Several coils had been cut out of the 50 H.P. water supply motor from time to time until a complete rewind job was necessary. This rewinding was done in the General Shops and the motor returned to the mine about Sept. 1st.

PRINCETON MINE

Some changes have been made during the past year to relieve the distress that was so apparent on the haulage and scraper machine circuits due to low voltage. The D.C. voltage conditions are good throughout the underground workings of this mine since the circuitbreaker and bus arrangement for parallel operation of M.G. set and convertor has been completed.

A new pole line with bare copper wire equal to 4/0 size has been built from the engine house to #3 shaft. A new 4/0 concentric shaft cable has also been connected from this new line on surface to the double trolley feeders on the 6th level.

Hoisting difficulties were pretty much cleared up on the skip hoist at the #2 shaft when the rebuilt resistor consisting of 27 boxes of grids was installed. This replaces the old set up which was much too small.

SPIES VIRGIL MINE

Pumping equipment has been repaired including circuit breakers and the two 150 H.P. motors. These motors were sent to the General Shops for repairs to windings, slip rings and bearings.

Compressor difficulties have appeared several times the past few months due to the loose stator coils in the 403 H.P. synchronous motor. This has been taken care of in good shape by filling the slots and wedging the coils. The work was done at the mine with the help of some of the shop men from the General Shops.

After a commutator breakdown on the exciter for this compressor, our spare armature from the Cliffs Shaft Mine was sent to the Spies Virgil while new commutator insulation was built into this armature at the shops.

ELECTRICAL DEPARTMENT
ANNUAL REPORT
YEAR 1944

SPIES VIRGIL MINE (Cont'd.)

When the drifting operations on the 4th level required a larger blower it was decided to borrow a 25 H.P. blower with an A.C. motor from the Mather Mine until a new one could be bought. About 500 ft. of #4 - 3-conductor old cable at the mine and 1000 ft. of new #4 - 3-conductor cable from the General Storehouse was used for this job. The necessary transformers were taken from the Cliffs Shaft Mine pit loading operations near the Storehouse Yards.

MATHER MINE

D.C. power for the skip and cage hoists has been furnished by the 2500 H.P. skip hoist M.G. set most of the year. The maximum rope speed of both hoists has been set at about 1600 ft. per minute.

The two General Electric battery locomotives purchased during the year have been received and are now in service.