

During the storm in February, 1936, the surge-chamber gate control lines swung together, causing the surge-chamber gate to drop. The push-buttons in the gate-control house have been covered with glass cases, to prevent accidental operation.

The control-room has been silenced by lining the walls with insulating board and putting in double windows, and in order to maintain adequate ventilation a 24-in. fan was installed in the roof and slots opened up in the floor. New lighting fittings were installed, the average intensity of illumination being increased from two and a half to seven foot-candles in the centre of the room.

Test switches have been installed to test the various circuit-breaker trip circuits. A fault on a 110 kv. air-break switch revealed that under certain conditions the indicating lights did not show the true position of the switch-arm, and accordingly new auxiliary switches are being installed to take care of this. Over-voltage relays have been installed to protect the main generators.

In the outdoor station new sleepers were laid in the centre traverser track, and schemes were prepared for lighting the outdoor structure and erecting screens to protect workmen while near high tension apparatus.

#### (b) SUBSTATIONS.

*Khandallah.*—One 110 kv. capacitor bushing failed, but was taken out of service without causing an interruption. All capacitor bushings have now been fitted with new porcelain rain-sheds.

One single-phase unit from the main transformer banks was taken out of service during the year for inspection. The core and windings were lifted out and found to be in excellent condition after eleven years' service, no trace of sludge or moisture being found. At the same time, the oil was renewed in the high-tension bushings, and the low-tension bushings were overhauled.

New inverse time overload relays were fitted on the east and west 11 kv. transformer O.C.B.s, and on the Wellington City Nos. 1 and 2 feeder O.C.B.s.

Other work done includes the following: Repairs were carried out to the regulator rotor of the Testing transformer, the pilot-lighting of the 11 kv. switch-gear was changed over from D.C. to A.C., and an automatic relay installed, and a new recording K.V.A.H. and K.W.H. meter was installed on the railway feeder. The test-tank for bushings was fitted with immersion heaters in order to carry out tests in hot oil.

*Melling.*—On the 26th May, lightning struck and caused severe damage to one single-phase unit of the transformer bank. The tank burst, allowing the oil to escape, and the windings were destroyed by fire.

A new transformer unit without radiators and fittings was ordered, and has been dried out as a spare, being fitted with radiators and other serviceable parts from the damaged unit.

At the same time new windings were ordered for the damaged unit and will be fitted to the undamaged core. The old tank was repaired, and will be used as a storage-tank for the reconditioned coils when these are dried out.

During a flood in the Hutt River, the substation site was flooded, the water rising to the level of the lower workshop floor. On another occasion a serious flashover took place on the Hutt Valley Power Board's 11 kv. structure, shattering a number of insulators.

*Bunnythorpe.*—A synchroscope has been installed for the purpose of paralleling the system on the bus-tie O.C.B., and gear has been installed so that when both bus-tie switches are open, single-line protection will be on the two Bunnythorpe-Mangahao lines.

*Marton.*—A 110 kv. transformer bushing which gave a low megger reading was changed, and the tripping battery and D.C. wiring overhauled.

*Wanganui.*—Repairs were carried out to No. 5 air-break switch, and the traverser track and truck were overhauled in readiness for the installation of the new transformer bank.

*Hawera.*—Interruptions to supply were caused on two occasions during lightning storms. On the first occasion all three lightning-arrester fuses were blown, and on the second one fuse was blown.

*Stratford.*—On the 13th and 14th April a heavy deposit of salt was left on the structure during a storm, necessitating the cleaning of the whole structure.

The metering-equipment on the Arapuni tie-line has been modified to measure the kw. demand in both directions.

*New Plymouth.*—No trouble was experienced here during the year, except on one occasion when all three lightning-arrester fuses were blown during a lightning-storm in the district.

*Masterton.*—During the gale on the 2nd February, 1936, an earthquake release clamp came adrift, allowing a 110 kv. lead to one transformer to fall on the conservator tank, but no damage resulted.

*Mangamaire.*—A new armature was installed in the operating motor of the 110 kv. O.C.B. Following low megger tests, this O.C.B. was taken out of service and the bushings, pull-rods, and tanks were dried out, and at the same time provision was made for draining the oil from the bushings.

*Woodville.*—During the reconstruction of the substation, new post insulators were fitted to the air-break switches.

*Dannevirke.*—Eighteen defective post insulators and four switch units were changed on the structure, and a spare 110 kv. bushing was modified so that it can be readily emptied of oil.

*Waipawa.*—The metering-equipment was transferred from a panel on the 11 kv. switch-gear to a new swinging panel mounted on the wall, and new meters and relays were installed on No. 1 transformer panel.

*Napier.*—Four faulty bushings and one faulty cable-box were taken out of service for overhaul before any interruption to supply occurred.

A number of faulty switch and post insulators on the structure were also replaced.