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PROGRESS ON THE SHANNON

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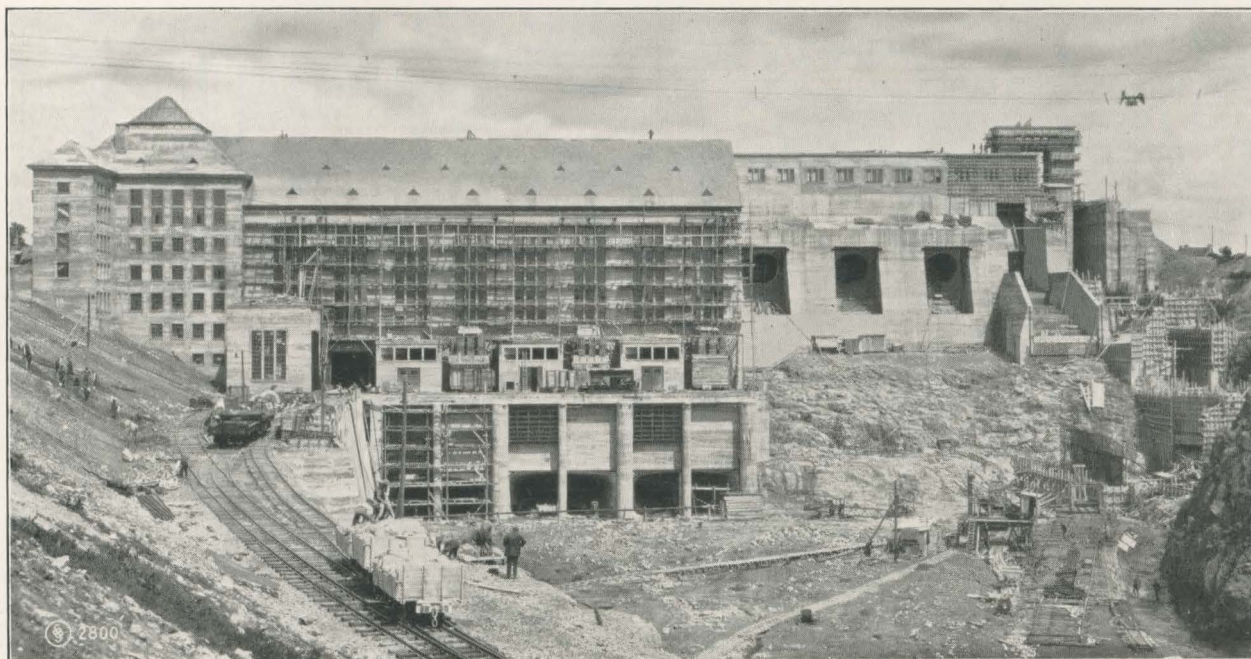
NUMBER 11

Power Station

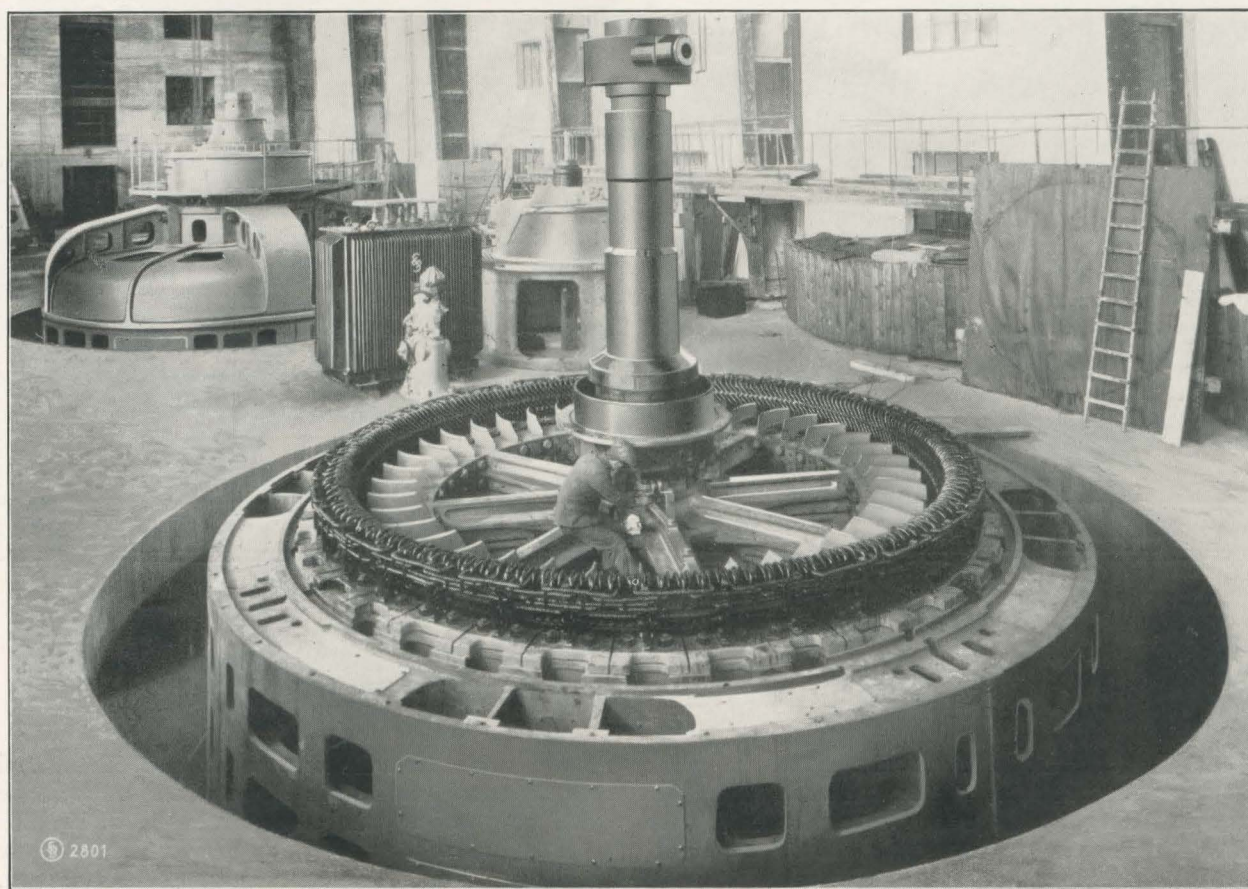
General Description of the Electrical Part

The Power Station at Ardnacrusha may be called the heart of the Shannon Scheme as here the Electrical Power for the supply of the Irish Free State is generated and from this source the Transmission and Distribution systems are fed. Picture 1, taken at the end of May, 1929, shows the outside view of this Power Station with a portion of the Intake Building and Navigation Locks in the background. The Civil Engineering part of the work, i. e. the actual building, is now nearing completion.

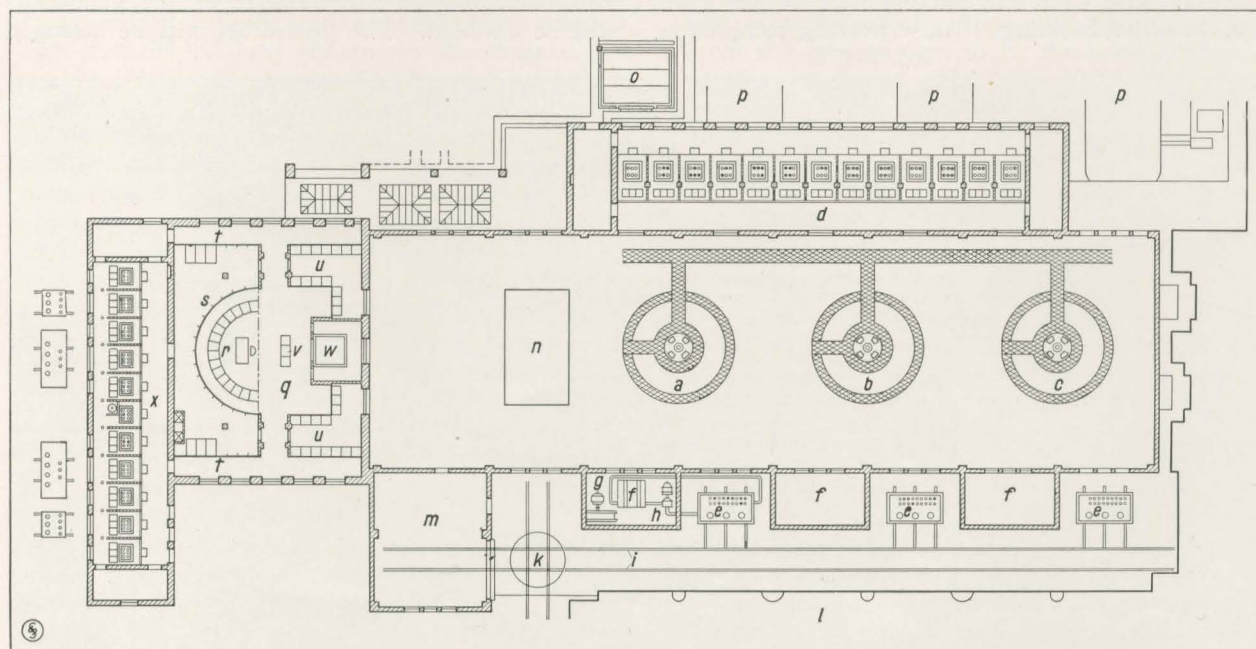
At the same time the erection of the Mechanical and Electrical Part in the Power Station has made good progress, as can be seen from Picture 2 which gives an inside view of part of the Power House with two of the generators in course of erection. For the First Development three such generators designed for 30000 kVA, 10500 V, Power Factor 0.7 and 150 r. p. m. have been provided. For the Full Development the number of the generators will be doubled. The generators will be arranged



Pict. 1. Power Station Ardnacrusha



Pict. 2. Inside view of the Power House

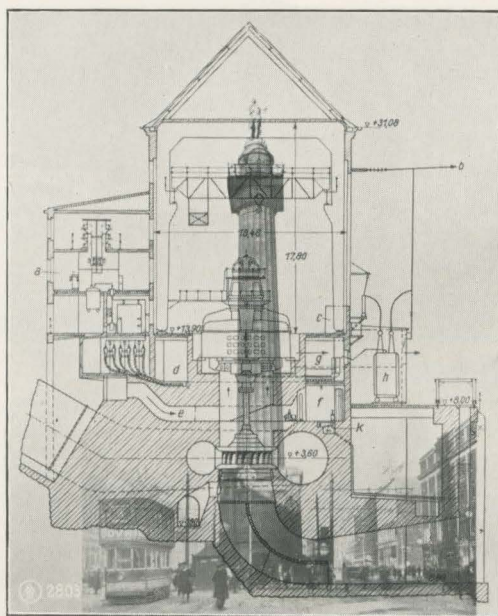


a = Generator I, b = Generator II, c = Generator III, d = 10.5 kV switchgear, e = 30000 kVA transformers 10.5/110 kV, f = Forced draught coolers, g = Fans, h = Oil circulation pump, i = Rail track, k = Turn-table, l = Tail race, m = Oil shop, n = Opening for crane, o = Water resistance, p = Turbine inlet pipes, q = Control room, r = Switch desks, s = Main switchboard, t = Realy boards, u = House service switchboard, v = Receiver desks for signal installation, w = lift, x = 38.5 kV switchgear.

Pict. 3. Plan of the Power House

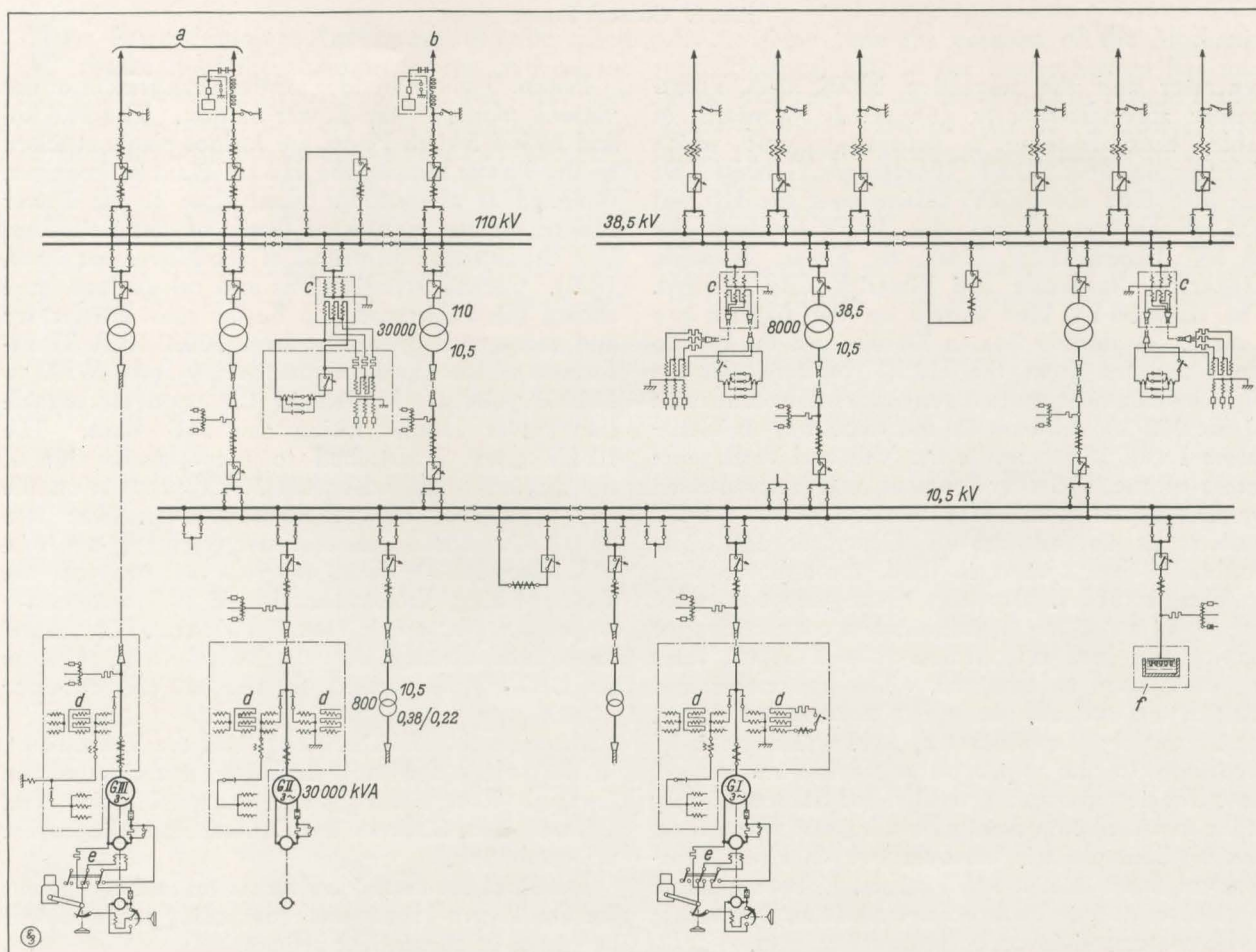
vertically and coupled directly to the turbines as can be gathered from Picture 4 which gives, in the first instance, as a basis, a cross-section of the Power House. On this basis, to facilitate appreciation of the actual dimensions of the Power Station, is superimposed, in the same scale, a photograph of the well-known Dublin landmark, the Nelson Pillar. This monument with its height of 134 feet would have to be about 20 feet higher to reach to the top of the Power House.

As well as the machines and apparatus for the main function of the Power Station, the generating of electricity, large plants must also be installed for distribution and operation. The connection



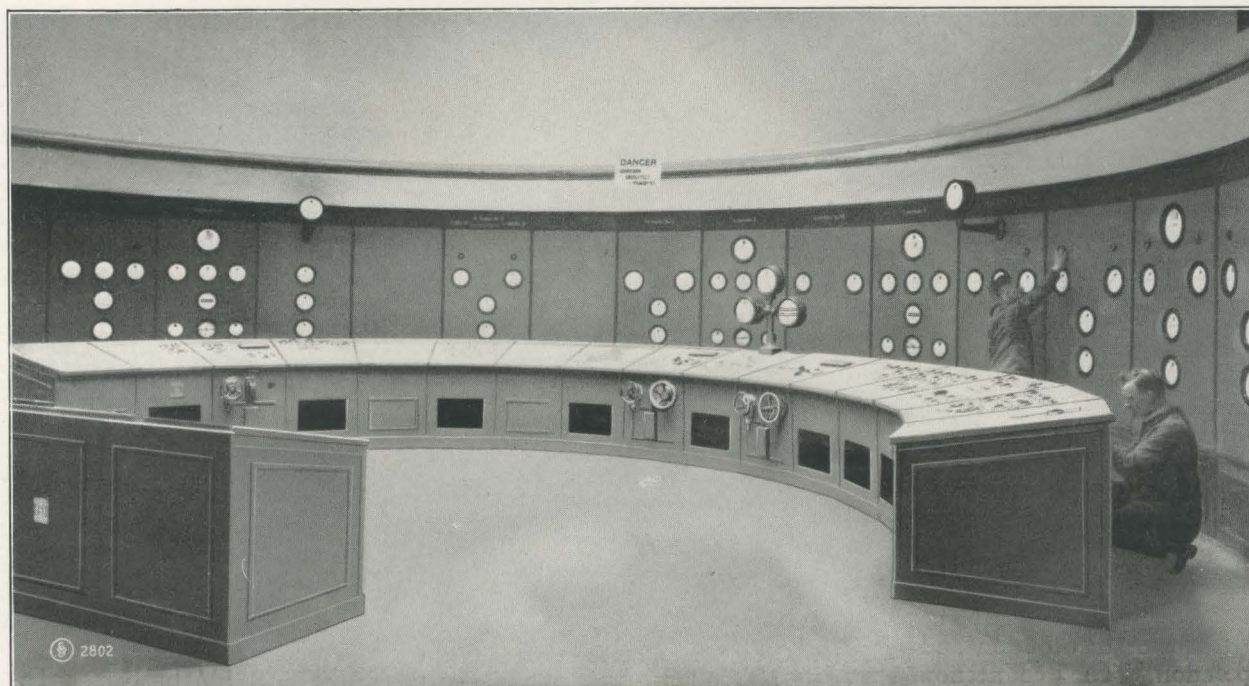
Pict. 4. Cross Section of the Power House, the Nelson Pillar superimposed.

Sketch, Picture 5, shows three distinct High Tension busbars in the Power Station and the attached plants, a busbar of 10.5 kV, at which voltage the electrical power is generated and busbars of 38 kV and 110 kV, the voltages for distribution. The Generators I and II are connected up with the 10.5 kV busbars from which the energy goes, over two 8000 kVA Transformers, to the 38 kV busbars and, over two 30 000 kVA Transformers, to the 110 kV busbars. Each of these generators can work either on to the 38 kV or the 110 kV system or on to both systems. Generator III works over a third 30000 kVA Transformer direct on to the 110 kV busbars. This



a = Duplicate line to Dublin, b = Line to Cork, c = Extinguishing transformers, d = Boosting choke coil for Generator protection, e = High speed de-excitation, f = Water resistance.

Pict. 5. Main Connection Diagram



Pict. 6. Control Room

generator and the respective 30000 kVA Transformer are permanently connected by means of cable, thus forming a generating unit which delivers current at 110 kV. If necessary, Generator III can also feed the 38 kV system over the 110 and 10.5 kV busbars. From the 38 kV busbars the 38 kV Transmission Lines to Ennis, Nenagh, Tipperary, Rathkeale and Limerick City are fed. The sixth 38 kV Line shown on the diagram is a reserve. A double line to Dublin and the line to Cork are fed from the 110 kV busbars. In the Full Development another generator will be connected to the 10.5 kV busbars in the same way as Generators I and II are, while the Vth and VIth generators of the Full Development will be connected by their respective transformers directly to the 100 kV busbars as in the case of Generator III. The double busbar system is used throughout, with coupling switches. By this arrangement a wide variety of switching operations and connections for service and load distribution as well as for cases of emergency is obtained. The generators and distribution systems can be run interconnected, i. e. synchronously, or separated, i. e. asynchronously, according to the requirements of the service. A Low Tension plant is provided for Station Supply at the Power Station, Intake Building and Navigation Locks. This plant is fed over two 800 kVA Transformers from the 10 kV busbars. The apparatus marked c, d, e, in Picture 5 are auxiliary apparatus; f is a water resistance for testing purposes.

Picture 3 gives an idea of the arrangement of the various plants in the Power Station. The 10.5 kV and 38 kV Switch Plants are indoor plants attached to the Power House; the 110 kV Plant is, however, designed as an outdoor plant close to the Power House on the right-hand bank of the Tail Race (see the situation on page 6 of the November issue, 1928). Careful investigations and calculations have shown this arrangement to be the most satisfactory and economical one. The large 30000 kVA Transformers which transform the energy from 10500 to 110000 volts are located in the open air outside the Power House facing the Tail Race. The 10 kV plant is attached to the opposite side of the Power House, while the 38 kV plant is on the left-hand side of the Power House. The two 8000 kVA outdoor transformers, stepping up from 10500 to 38000 Volts, as well as two of the Extinguishing Trafos for the 38 kV system are in position just outside the 38 kV Plant. The 38 kV Lines lead directly into the 38 kV Plant, whereas the 110 kV Lines lead to the 110 kV out-door Plant.

Between the Machine Room and the 38 kV Plant, in the so-called Middle Building, are situated the Control Room, the Work-shop, Oilplant and Offices. Pict. 6 shows the Control Room in course of installation.

Details of the machinery, apparatus and equipment for the Power House and concerning erection will be given in subsequent articles.